

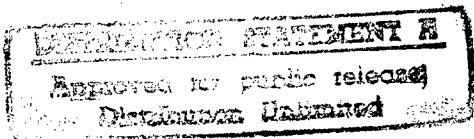
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SELECTED ECONOMIC TRANSLATIONS

ON EASTERN EUROPE

(196th in the series)



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SELECTED ECONOMIC TRANSLATIONS  
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INTRODUCTION

This is a serial publication containing selected translations on all categories of economic subjects and on geography. This report contains translations on subjects listed in the table of contents below. The translations are arranged alphabetically by country.

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POLAND

Proposed Principles for Multi-Year Financial Plans  
of Enterprises

[This is a translation of an article by Tadeusz Kierczyński in *Fianse*, Vol X, No 12, December 1959, Warsaw, pages 1-6; CSO: 3780-N/a]

Heretofore, multi-year plans had a fully directive character. Even on the level of central economic authorities, multi-year plans were treated only as recommendations, made more precise and finally fixed only in the annual economic plans. In this situation, conditions and possibilities for the preparation of multi-year financial plans of enterprises were lacking.

This state of affairs could not advantageously influence the stabilization of the economic policy. For this reason, at the Third Party Congress (Zjazd Partii) it was decided that "multi-year plans containing the main targets and indicators for individual years should constitute the basic form of planning. Multi-year plans for the 1961-1965 period should be prepared and confirmed as obligatory by all enterprises which have suitable conditions for this, and all the unions and economic ministries, in accordance with the premises of the National Economic Plan (Narodowy Plan Gospodarczy) for 1961-1965."<sup>1</sup>

Recognition of multi-year planning as the basic form of planning constitutes at the same time a premise for the necessity of changing financial planning in enterprises. However, this thesis has not yet been properly understood by a large part of the financial apparatus employees.

They are inclined to treat five-year financial planning as of no practical importance. The foundations for views of this kind lie primarily in lack of understanding of the new role of financial planning under conditions of increased autonomy of enterprises, and secondly in lack of faith in the technical and organizational possibilities of preparing a financial plan for a period of five years, adjusted to the changing financial situation of the country. These views are erroneous. As is well known, financial plans should implement two functions. The plan constitutes an order (directive) for the enterprise to execute the targets contained in it concerning the accumulation and distribution of monetary resources. The second

function of the plan is its role as an instrument on the basis of which the management of the enterprise conducts a rational monetary management.

In the past years, and also at present, financial planning in enterprises has in principle been limited solely to the former function. The indices contained in the plan are either a directly obligatory directive or a justification of directive indicators. As a matter of fact, a tendency has recently emerged to eliminate entirely from the plan indicators and data which have no directive character. This situation should be changed. It seems that, with the deepening of the autonomy of enterprises, financial planning should increasingly become a tool for the management of the enterprise to shape its financial situation.

\* \* \*

Autonomy of enterprises in the financial sector is manifested, as is well known, in having disposition of the sums of the development and factory funds, and the right to receive bank credit. The first condition for rational management of these sums is the possession of a plan for their accumulation and expenditure. It is difficult to imagine that a major enterprise, possessing many millions for these purposes, could undertake decentralized investments or wider housing construction from the factory fund without a detailed plan for financing these undertakings. The bank too will not be able to grant credit for investments until the enterprise presents a plan for accumulation and utilization of the development fund from which this credit will be repaid.

In this sense, the financial autonomy of enterprises not only does not decrease the scope of financial planning, as some think, but, on the contrary, requires its being deepened.

Under conditions of a defined financial autonomy of enterprises, the need for multi-year planning also emerges in a much more acute way. In a system which is based on the principle of making the development of enterprises almost fully dependent on subsidies received from the superior units, the shortcomings of short-term planning become apparent mostly when the directives included in the plan are erroneous. By assumption, the enterprise should limit its own initiative only to the execution and exceeding (in the field of revenues) of the indicators of the plan. The results of "living from

day to day"--that is, without a long-term outlook--are much more dangerous when an enterprise to a serious extent determines by itself the rate and direction of its development on the basis of monetary resources accumulated for this purpose.

The investment activity of the enterprise, in both productive decentralized investments and construction from the factory fund, cannot for technical reasons be kept within an annual circle and it requires, as a rule, periods of a few years. The absence of stabilization of the financial situation of the enterprise as a result of changes, from year to year, in the elements of the financial system and directives of the plan--for example, the principles of creation of funds and ties with the budget, must disorganize this activity and cause losses. Finally, it is not necessary to prove that a condition for the operation of incentives connected with financing of enterprises from the accumulation collected by them is the stability of their financial situation. If the enterprise is to manage effectively the resources placed at its disposal, it must be sure that the accumulation of its fund in accordance with the norms fixed in the plan will depend on the fulfillment (or improvement in comparison with the plan) of the indices of production and the lowering of costs of production.

The opponents of multi-year planning, to show its unrealistic nature, point to the present experiences in annual financial planning. Arguments are provided especially by the current situation in the field of implementation of decentralized investments, the volume of which in 1959 exceeds so much the index accepted in the NPG [Narodowy Plan Gospodarczy; National Economic Plan] that this has a negative influence on the general market situation.<sup>2</sup> The conclusion is derived from this that if the formation of the investment funds in enterprises could not be properly forecast in the annual plan, how can it be expected that it can be done properly over a five-year period? Of course, such arguments cannot be ignored. However, they apply to a situation which would exist if multi-year planning were introduced with the existing forms of financial planning and the present financial system. The essence of the matter consists in applying such new forms of planning and transforming the financial system in such a way as will permit the preparation of five-year financial plans with a sufficient degree of precision. This requires finding a solution for several difficult problems, two of which seem to be of basic importance. They are:

[1] The problem of choosing the scope and forms of directive indicators and the relationship of these indicators to the norms of the financial system and indicators calculated for the needs of managing the enterprise,

[2] The problem of methods of solving inconsistencies between the postulate of stability of the financial situation of the enterprise and the needs of current state policy.

\* \* \*

The way to solve the first problem can be outlined as follows. The five-year financial plan of the enterprise consists of two parts. The first contains indicators constituting a state directive, the second indicators approved at the motion of the director by a conference of the workers' self-government.

Directive indicators regulate the financial ties of the enterprise with the budget and the union and determine the financial allocations. Wherever possible, these indicators should be expressed not in absolute figures but in ratios that --following Czech patterns--create the so-called multi-year norms.<sup>3</sup> It seems that this is the only way in which it is possible to build sufficiently elastic directive financial indicators, adjusted to the changing financial situation of the enterprise.

In this concept, the first part of the plan would contain the following indicators:

a) Norms concerning the settlement of accounts between the enterprise and the budget:

- 1) turnover tax rates;
- 2) rates of payments from profits (rates of the progressive tax on profits).

b) Norms concerning the settlement of accounts between the enterprises and the unions:

- 1) rates of payments of enterprises to the reserve fund of the union;
- 2) rates (or sum) of markups on the costs of enterprises for the costs of maintenance of the union;
- 3) rates determining the sums received or paid by enterprises for accounting prices;

- 4) rates of distribution of depreciation into the part remaining in the enterprise and the part paid to the union.

c) Financial allocations:

- 1) allocations determining the amount of the factory fund and payments from this fund for individual premiums;
- 2) wage fund allocations;
- 3) allocations for financing centralized investments.

The above-listed indicators may be fixed in the same or different magnitudes for the individual years of the plan.

The rates of the turnover tax, rates of payments from profits, principles of creation of the factory fund, and all the other listed indicators are, as is well known, elements of the financial system of enterprises. Therefore, it is possible to ask what is the connection between the financial system as a collection of legal and organizational norms and that part of the five-year plan which contains directive indicators. Though both these institutions regulate the same process of collection and distribution of financial resources in the enterprise their role is not the same.

The financial system regulates the settlement of accounts of the enterprises with the budget and the union, the creation and utilization of the development and factory funds, management of working capital and wage fund, financing of fixed assets, etc. The financial system also determines the principles of construction and application of all kinds of rates and their possible progression in the individual sections and branches of the economy. On the other hand, the five-year plan formulates these rates with regard to the individual enterprise, thus transforming them into norms obligatory only to that enterprise. In most cases, such individual rates or progression tables within the framework of general principles accepted in the financial system will turn out to be necessary because of the different conditions in which the individual enterprises operate. Where such need will not arise, the rates determined in the financial system could directly constitute norms for the enterprises.

From the connection between the financial system and the plan definite postulates result concerning the reconstruction of the existing financial system. This is a problem which requires separate discussion. It could at most be pointed out

as an example that the present lump sum system of settlement of accounts between the ministry and the budget for the profits of subordinate enterprises is unacceptable from the point of view of the needs of long-range planning, because it renders the use of norms impossible. However, for long-range planning it would be convenient to introduce a progressive tax on profits. Similarly, a consideration from this point of view is needed by the situation concerning the turnover tax, the principles of creation of development and factory funds, settlements of accounts between the enterprise and the union, etc. Undoubtedly, solutions useful for multi-year planning will turn out to be less advantageous for other reasons. However, it seems indispensable here to give priority to the needs of planning even at the cost of discomfort in other sectors. This follows both from the importance of the multi-year plan as an instrument for directing the enterprise and from the fact that the majority of incentives provided in the financial plan will remain on paper or will start operating negatively if it is possible to introduce realistic multi-year planning.

The second part of the five-year financial plan of the enterprise should give the expected picture of the formation of revenues and expenditures in the individual years of the plan. In this part, indicators would occur (in absolute figures) which would determine the formation of the following magnitudes:

- Sales, production costs and accumulation
- Payments from the budget for the turnover tax and tax on profits
- Payments to the union and subsidies from the union
- Development fund and its utilization
- Financing (including bank credit) of decentralized investment
- Financing (including bank credit) or the increment in the norm of working capital
- Factory fund and its utilization

The turnover tax, the tax on profit, the factory fund, etc. would be calculated by the enterprise on the basis of norms contained in the first part of the plan. Of course, the enterprise makes the settlement of accounts with the budget and the union on the basis, not of these planned sums but of actual execution and norms. The management of the enterprise should report the execution of the second part of the plan to the conference of the workers self-government which approves the plan.



The norms would be fixed by the ministries acting in agreement with the Ministry of Finance (Min. Finansow) on the basis of the drafts of five-year plans prepared from above by the unions. The plans of unions contain, in principle, the same items as the plans of enterprises (in Part II), plus items determining the management of the financial resources of the unions and their settlements with the budget. The final version of the plan would be prepared by the unions on the basis of the plans of enterprises.

The postulate of stabilization of the five-year plan may in individual periods be inconsistent with the needs of current economic policies stemming from important state interests.

Generally speaking, two situations may arise: 1) the sums due to the enterprises in accordance with the fixed norms will turn out to be too large from the point of view of the current financial policy of the state; 2) it will become necessary to impose new tasks on the enterprise, which, from the financial point of view, are less advantageous than those stipulated in the five-year plan. In the former case the most proper way is to realize the requirements of the current financial policy, not directly but by a round-about way. Thus, if it turns out that the prevailing principles of creation of the factory fund ensure in a given enterprise or group of enterprises excessive deductions, it will be necessary to expand housing construction financed from the fund, at the same time decreasing ZOR [Zarząd Osiedli Robotniczych; Administration of Workers' Settlements] construction in the given area.

An undesirable increase in the development fund may be neutralized by manipulating the level of investments and of bank credit. Technical progress is practically unlimited, and therefore in almost every enterprise there exists demand for modernization investments to increase production, labor productivity, or conditions of safety and hygiene of work. Hence in the majority of cases the only problem is that of preventing the use of the development fund for accumulation of excessive reserves. This can be counteracted by the bank by using a proper credit policy. In certain cases the union may redistribute funds between enterprises in the form of loans granted for a specific period (not longer than a year) by one enterprise to another for decentralized investments.

In certain cases it may become necessary to decrease the allocations for decentralized investments (or to require the participation of the funds of the enterprise in financing decentralized investments), or the location of new additional

production in an enterprise possessing a large development fund which will increase its demand for investments and increment in working capital. The indicated method of solving conflicts between the need for stability of the financial system and the five-year plan, and the requirements of the current financial policy of the state in the individual years, is, despite certain inconveniences, much more advantageous than a change in the principles of the financial system or a simple removal from the enterprises of financial sums considered superfluous there. This last act would, as is well known, destroy the system of incentives.

In case of a need to impose on the enterprise financially less advantageous tasks than was stipulated in the five-year plan, the enterprise should receive as complete a financial compensation as possible (e.g., in the form of accounting prices for this part of its production).

If in the course of execution of the five-year plan some essential changes should take place in the conditions of production, prices, and wages, and the commodity composition of production, the enterprise should prepare a new multi-year plan. Situations in which it would be possible to change, through annual plans, the basic indicators of the five-year plan should be considered as contrary to the targets of multi-year planning.

#### Footnotes

<sup>1</sup>Nowe Drogi, No 4, 1959, p 706.

<sup>2</sup>It can be added that there are even postulates for the liquidation of financing investments from profits of enterprises. A move of this kind would, of course, mean the loss of almost all the achievements of the last two years in the field of financial autonomy of enterprises, and the very proposal has something in common with the recipe for combating railroad delays by canceling late trains.

<sup>3</sup>It would make no sense to determine the indicator for financing centralized investments in any but absolute figures.

## POLAND

### Reform of Amortization System

[This is a translation of an article by Zygmunt Witkowski in *Finanse*, Vol X, No 12, December 1959, Warsaw, pages 15-21; CSO: 3780-N/b]

The field of fixed assets is undoubtedly the aspect of the financial management of enterprises which requires definite reforms. This applies not so much to "active" management--that is, the principles of utilization of fixed capital--as "passive" management, or problems connected with the process of self-financing of fixed assets. The essential difficulty which so far prevented getting this matter in order is the unrealistic bookkeeping value of fixed capital of enterprises. The changes in prices of investment projects which occurred in recent years were not accompanied by a corresponding evaluation of existing fixed assets. This fact undermined economic calculation in this field. The calculation of both effectiveness of existing fixed assets and their replacement became a fiction. This shortcoming also makes impossible the study of the effectiveness of restitution and development investments, which should be compared first of all with the effectiveness of existing productive installations.

In connection with the already approaching revaluation of the fixed capital of enterprises, it becomes timely to set in order its book entries, classification, and amortization. The necessary preparatory work has already been started in this field. This also applies to the amortization system.

In *Finanse*, No 1, 1959, there appeared a discussion article by Zdzisław Fedak entitled, "How to Reform the Amortization System." In this article, Z. Fedak outlined a plan for a new system of amortization of fixed assets of enterprises. This plan was characterized by interesting solutions; thus it had a wide response. A discussion then started in *Finanse* on the concepts planned by the author of that article.<sup>1</sup>

The problems connected with active and passive fixed capital management require an all-round and penetrating study. It seems that it is already possible to sum up and evaluate the statements made so far.

For a better orientation and comparability of various concepts, we recall in the beginning the principles of the existing amortization system. On this basis we will characterize the plan of Z. Fedak and then, in turn, the proposals brought forward by the discussion participants. We shall limit ourselves to key system problems. These problems are:

- 1) The method of amortization--that is, the course of the process of depreciation of assets accepted for the calculation of the amortization rate;
- 2) the construction of the amortization rate determining the sources of financing the replacement of fixed capital;
- 3) norms regulating the course of the real amortization cycle;
- 4) bookkeeping entries of amortization;
- 5) amortization funds and their utilization;
- 6) results from liquidation of fixed assets.

\* \* \*

The system of amortization of fixed capital of enterprises, in force (with some changes) since 1946, is based on the following assumptions:

Fixed assets are subject to amortization on the assumption of their depreciation being proportional to the passage of time (the linear method). An exception are motor vehicles, which are depreciated according to their mileage. The amortization cycle is calculated by taking into account solely the physical wear of fixed assets (their economic wear is not taken into account).

A characteristic property of the present system is the far-reaching regulation of the amortization calculation. This is expressed in standardization of all factors determining the process of self-financing of fixed assets. The amortization rate is calculated on the basis not only of the initial value of fixed assets but also taking into account their capital repairs, costs of liquidation, and recovery of materials. The construction of the rate is based on the assumption that capital repairs prolong the duration of utilization of fixed assets in the same ratio in which the costs of capital repairs are related to the initial value of fixed assets. The amortization rate does not take into account medium and current repairs.

In connection with the introduction of capital repairs into the amortization calculation, the enterprises accumulate two funds:

- 1) the fund for reproduction of the initial value of fixed assets;
- 2) the fund for capital repairs.

The former expresses the processes of making the fixed fund liquid. The second constitutes a reserve for expenditures in the future periods. In case of nonfulfillment of conditions assumed in the amortization rate, the planned process of self-financing is distorted. This occurs in case there is a larger or smaller volume of capital repairs than was calculated, higher or lower costs of repairs than calculated, prolongation or shortening of repair cycles. In this situation, in order to finance the current restitution needs, transfers are necessary from the replacement fund to the repair fund and the other way around.

We distinguish between the moratorium cycle and amortization cycle. The moratorium cycle starts with the beginning of utilization of the project and ends with its complete moratorium or premature liquidation. The duration of amortization runs until the liquidation or sale of the project. The method or intensity of utilization of fixed assets are not taken into account. In case of a temporary withdrawal of the project from operation, the course of the moratorium and amortization cycles is interrupted.

Moratorium of fixed assets is entered in capital accounts. Depreciation is transferred to the replacement and repair account. The amortization is distributed between the two funds in the ratio of the initial value and calculated costs of capital repairs to their total. As a result of the difference between the moratorium and amortization cycles, and also of the different systems of subjecting to amortization certain fixed assets (motor vehicles) from the principles of their moratorium, amortization is not equal to moratorium.

The results from liquidation of fixed assets are transferred to the fixed fund. In case of a premature liquidation of a fixed asset, the replacement fund is supplemented by the remaining value of the liquidated project.

\* \* \*

The proposal of Z. Fedak is based on the following principles:

Fixed assets should be subject to amortization on the assumption of a uniform course of wear. The linear method of amortization ensures accumulation of funds corresponding to the replacement needs; equalizes the level of costs and profitability; creates incentives for reinvestments; and simplifies planning, calculation, control, and book entry of amortization. If the age of fixed assets is longer than the practical possibilities for their utilization (for example, in the mining industry), it is necessary to use amortization proportional to the size of production. The same applies to motor vehicles in transport units.

Z. Fedak proposes two alternatives for the construction of the amortization rate. In branches of industry in which capital repairs play a large part and are subject to major year-to-year changes, it is necessary to use two separate rates: "replacement" and "repair." The first is to safeguard funds for investments, the other funds for repair. Replacement rates should be fixed for periods of 10 to 15 years for the individual type groups of fixed assets. They would be unified (group) rates, uniform for all branches. For projects which are of essential importance in the given enterprise, detailed (individualized) rates should be fixed. It is indicated to differentiate the rates according to the conditions of use of fixed assets. However, the number of rates should not be too high. In view of technical progress and changes in economic conditions, replacement rates must be periodically revised. In order to eliminate the adverse effects of price movements, it would be necessary to apply, while the rates are in force, conversion coefficients for the initial value of fixed assets or for the sum of amortization. Repair rates should be set for much shorter periods. It is not recommended to set them for longer periods in view of price and wage movements influencing the level of capital repairs. For this reason it is necessary to modify them according to need. In the author's opinion, modifications every three or four years would be indicated. The method of calculating repair rates depends on the significance of the individual components of fixed capital. For decisive aggregates in the given branch it is necessary to calculate them in a precise way, on the basis of a definite volume and costs of capital repairs. For the remaining machines it would be necessary to determine uniform branch rates, and--for buildings, constructions, and means of transport--uniform national rates. Rates could be expressed in percentages of the initial value

of fixed assets, or rather of replacement rates. The number of repair rates should not be higher than the number of investment rates.

In the branches of the economy in which capital repairs play a lesser part and are not subject to major fluctuations, it would be proper to relinquish the calculation and amortization of these repairs. These enterprises should use only one amortization rate, one which would ensure the replacement of the initial value of fixed assets. Repairs would be covered from working capital.

In contrast with the present practice, the author eliminates from the amortization rate the costs and revenues from the liquidation of fixed assets. These items are small and they unnecessarily complicate the construction of the amortization rate.

The amortization rate should be calculated, taking into account not only physical wear but also economic depreciation of fixed assets. For this purpose, a corresponding shortening of the amortization cycle is necessary.

The real period of amortization of fixed assets should be regulated as follows: replacement amortization should be calculated when the fixed assets begin operation. Temporary withdrawal of the project does not interrupt the course of amortization. The method and intensity of utilization of fixed assets is also not taken into account.

Replacement amortization should also be calculated after the passage of the calculated amortization cycle, until the moment of liquidation or sale of the fixed asset. Amortization for capital repairs should be calculated according to analogous principles, but inactive fixed assets should not be subject to amortization. It would be advisable to provide for deviations in real shift work from "rational" shift work. This would require a proper correction of repair rates with the aid of coefficients. As was already mentioned, the author suggests further amortization of projects subject to full amortization but not withdrawn from operation. They should be subject to amortization according to a lower rate, covering at least the calculated costs of capital repairs. For this purpose it would be necessary to correct properly the initial value of fixed assets subject to moratorium (with the aid of deflating coefficients).

Far-reaching changes are suggested by Z. Fedak in the present system of book entries of amortization. In capital accounts, only the moratorium of fixed assets should be entered in the amount of amortization for replacement of fixed assets. This solution would eliminate the errors resulting in determining results from utilization of projects (in view of the changes in costs of capital repairs). In the account of settlement of amortization it is necessary to enter the full amortization for replacement and for capital repairs. The author does not say whether this amortization should be transferred to one investment-repair fund account or to two separate accounts. In this case difficulties might arise in financing capital repairs and restitutions in case of possible disproportions between the restitution needs and accumulation of funds.

The result of liquidation, constituting the difference between the initial value of fixed assets (plus possible costs of liquidation) and moratorium (and possible recoveries) should flow to the statute fund.

\* \* \*

J. Szczepaniak speaks for a much more advanced simplification of the system of amortization. This applies in particular to the method of calculating the amortization rate and book entries of amortization.

As concerns the method of amortization, he speaks for regressive amortization. Since the correct determination of the degree of regression is not possible, he suggests deduction of amortization in a fixed percentage from any net value of fixed assets. This method reflects better the real wear of the substance of fixed capital.

J. Szczepaniak is opposed to taking into account in the amortization rate of costs of capital repairs. The amortization rate should be calculated solely on the basis of the initial value of fixed assets. The costs of capital repairs should not be anticipated and financed from the amortization fund accumulated for this purpose. Real costs of repairs should be financed from the working capital and accounted for as outlays for future periods.

In contrast to the proposal of Z. Fedak, he proposes to regulate the calculation of amortization during a fixed amor-



tization period. He confirms the necessity of subjecting unused fixed assets to amortization. They are being worn out, not only economically but also physically (as a result of atmospheric influences). The duty of subjecting unused projects to amortization would incline the enterprises to utilize them rationally. However, amortization in a period of inoperation of projects should be entered not in costs but in the account of losses and profits. He speaks decisively against amortization on fixed assets subject to complete moratorium but still utilized. The creation of an amortization fund from these deductions is improper. If the questioned principle were accepted, it would be necessary to enter this amortization in the costs and to the advantage of the account of losses and profits, as a correction of costs of previous years (as a result of fixing too high an amortization rate, the operating costs of the past years were improperly inflated).

He is also definitely opposed to separate treatment in bookkeeping of moratoriums and amortization. There should be no difference between the moratoriums and amortization in the books. Amortization should be entered in the books as cost and to the advantage of the account of moratorium of fixed assets. The statute fund should not be subject to change. Corresponding to a decrease in the value of fixed assets is the sum allocated to their reproduction, included in costs. One should conclude from the author's reasoning that the costs of completed capital repairs should be transferred to the moratorium account. In this way the balance in the moratorium account would indirectly correct the initial value of fixed assets.

The author is against the order to place the resources of the "moratorium" fund in special bank accounts. The enterprise should have freedom regarding their utilization. There should be no obstacles to the utilization of these funds also for temporary financing of operating activity, if this ensures advantages.

The reasoning of J. Szczepaniak concerning the results of liquidation of fixed assets is not clear. The sum of the value, not subject to moratorium, of the liquidated fixed asset should go to the investment fund. The result of liquidation should be entered in the account of losses and profits. The monetary equivalent of the result of liquidation should increase or decrease the working capital of the enterprise.

\* \* \*

E. Meisner holds an intermediate position between the concept of Z. Fedak and that of J. Szczepaniak.

Concerning the method of amortization, he states that none of the methods makes amortization completely correspond to the actual degree of physical wear and even less to the degree of obsolescence. In order to reduce this difference to a minimum, it would be advisable to use different methods for the individual groups of fixed assets. Buildings, constructions, and installations, depreciating mostly as a result of operation of natural factors (and not technical progress), should be subject to amortization according to the uniform method. Machines, which are first of all subject to "technical" wear resulting from their operation, should be subject to amortization according to the following principles: if technical wear is proportional to the productive utilization of machines and their obsolescence constitutes a non-essential element, the linear method should be used. However, if the technical wear of machines is nonuniform, the regressive method must be used. The same applies to machines subject to rapid obsolescence. The author stresses the advantages of the regressive method but does not take into account its disadvantages (absence of correlation between the accumulation of resources and repair needs, absence of incentives for replacement of old machines, complicated calculations, difficulty in planning and analysis of the process of self-financing of fixed assets, etc.).

E. Meisner also speaks against calculating capital repairs in the amortization rate. Determination for many years in advance of the real volume of capital repairs is not easy. This also applies to the determination of their costs. He opposes the argument of Z. Fedak that in enterprises of heavy industry the inclusion of real costs of capital repairs in the operating costs caused sudden rises in the individual accounting periods. It would follow from the practical examples quoted by him that in large enterprises the costs of capital repairs are more uniform than in small ones. He also states that corrections of amortization rates for capital repairs may be more burdensome than inter-period settlements of accounts for costs of these repairs.

E. Meisner occupies a different position from that of Z. Fedak as concerns the course of the real cycle of amortization of fixed assets. It is necessary to take into account here the specific conditions of individual types of fixed assets. Buildings, constructions, and installations, which are subject mostly to physical wear, should be subject to amor-

tization uninterruptedly from the start of their utilization to their complete moratorium. The same applies to machines subject mostly to technical wear resulting from their work. In case of prolonged idleness, their amortization rate should be lowered. His attitude toward amortization of fixed assets subject to complete moratorium is negative. He states that this is not justified by the influence of amortization either on the level of costs or the volume of the replacement fund. A similar criterion should be accepted in case of premature liquidation of fixed assets. In order to ensure complete restitution of such assets, it is necessary to make an additional deduction in the amount necessary for full moratorium. The amortization fund supplemented in such a way would guarantee the proper simple replacement of worn out fixed assets.

The above attitude is a consequence of the postulate of equalizing moratorium with amortization, also brought forward by E. Meisner. He states that the principle of separate entries for amortization and moratorium has no justification under our conditions.

E. Meisner also brings forward the postulate of leaving to the enterprise the freedom of temporarily disposing of the free funds from amortization. Contrary to J. Szczepaniak, however, he excludes their utilization for purposes of operating activities. They should be utilized mainly to cover repair outlays, refunded at the time of settlement from operating funds. If they did not suffice for this purpose, the enterprise should cover the shortage with the aid of bank credit. This principle would safeguard the correct utilization of accumulated depreciation left at the disposal of the enterprise.

\* \* \*

The last participant in the discussion, K. Miekus, deals mostly with methods of calculating amortization in agriculture. He speaks for the use of more precise methods than the method of uniform deductions. Buildings and outbuildings (rural) should be subject to amortization with the aid of average progressive rates, increasing from year to year. This practice has been used by the PZU [Panstwowy Zaklad Ubezpieczen; State Insurance Bureau] since 1938. Machines in agriculture should be subject to amortization according to the regressive method which corresponds better to the real course of their wear. Like the previous participants in the discussion, K. Miekus

is opposed to separate treatment of moratoria and amortization.

\* \* \*

In the above remarks we characterized the concepts brought forward by the participants in the discussion on the reform of the system of amortization. Two opposing tendencies result from the confrontation of the opinions of the author of the basic proposal and the discussion participants.

A. Fedak brings forward the postulate of far-reaching simplification in the method of calculating amortization and greater precision in determining amortization rates. With regard to the bookkeeping entries of amortization, the simplifications suggested by him do not go very far. In principle, he maintains the present solutions and eliminates only the excessive rigidity in creating of reserves for capital repairs and book entries of amortization.

Personally, I favor the simplifications proposed by Z. Fedak concerning the method of amortization and simplifications postulated by the participants in the discussion concerning the calculation of the amortization rate, financing of capital repairs, and book entries of amortization.

In my opinion, a break from the practice of calculating the costs of capital repairs would ensure several important advantages: 1) the calculation of amortization of the capital substance and of self-financing of fixed assets would be simplified and clarified; 2) planning, control, financing, and analysis of the dynamics of both fixed assets according to net value and repair management treated as an all-embracing whole would be much easier; 3) the enterprise would have considerable freedom in formulating a repair and modernization policy; 4) the management of the enterprise would at the same time be forced to calculate the economic effectiveness of intended repairs.

The equalization of amortization with moratorium in bookkeeping entries would also have advantages. The realization of these concepts would simplify planning, bookkeeping entries, and analysis of amortization.

### Footnote

<sup>1</sup>J. Szczepaniak: "Certain Problems of Synthetic Bookkeeping Entries of Fixed Assets" (Finanse, No 3, 1959); Z. Witkowski: "Some Remarks on the Reform of Amortization" (Finanse, No 4, 1959); E. Meisner "More About the Reform of the Amortization System" (Finanse, No 7, 1959); K. Miekus: "Methods of Calculating Amortization in Agriculture" (Finanse, No 11, 1959).

## POLAND

### More on Inventory of Fixed Assets

[This is a translation of an article by Aleksander Paszynski in *Finanse*, Vol X, No 12, December 1959, pages 22-27; CSO: 3780-N/c]

On 31 December 1959, a general inventory of basic fixed assets in basic fields of the national economy will be taken. This will determine their replacement value (gross) and, indirectly, as a result of an evaluation of the degree of wear, the real value (net), uniform classification, composition, and limits.

The purpose of this article is not an evaluation of the methods of taking general inventory and the methods of preparing the results of this wide-scale undertaking. However, it seems that it is necessary even now to ask what comes next?

Before we try to answer this question, some introductory remarks and explanations of a historical nature. The present scope of the general inventory results from specific situations and experiences of the many years of preparation for this program.

The first plans provided for taking a general inventory of the national economy and on a very wide scale. The purpose of the inventory planned at that time was to obtain the necessary data to facilitate administration of the national economy. For these reasons the initiator of the program--the PKPG [Panstwowa Komisja Planowania Gospodarczego; State Commission of Economic Planning]--placed the main stress on obtaining detailed data which would depict the quantitative and qualitative structure and other information on the possession of fixed assets by the individual branches of the national economy, and therefore their potential, productive capacities and other technical and economic indicators. On the other hand, the other aspect of the inventory--an orderly management of fixed assets from the point of view of the user, the enterprise--was shifted to the second plane.

The planned scope of the inventory required, of course, a considerable outlay of labor and costs. For a long time attempts were made to find a way to overcome the situation

which prevented a decision on the inventory because of the costs involved, not by decreasing the scope of work and relinquishing certain findings but by attempting to stagger the inventory--that is, conduct in stages a complete inventory of buildings, construction, machines, etc. Such staggering of the work was unacceptable from the point of view of the enterprise because it would cause nonuniformity of findings and incomparability of results. If an inventory program and the setting in order of the management of the living organism of the enterprise is spread over a period of few years, naturally the inventory does not fulfill its purpose.

Only the last government resolution of January 1959<sup>1</sup> finally solved these difficulties. The starting point of the findings concerning the objective and subjective scope accepted in this resolution are the needs of the enterprise. In view of the impossibility of conducting the program throughout the national economy at present, the resolution provides for taking a general inventory of the fixed assets of state enterprises operating on the principles of economic accounting and obliged to make amortization deductions, as well as enterprises in which the share of the state is at least 50 percent and cooperative enterprises.

Thus, the following are not obliged to take a general inventory of fixed assets: budgetary units and budgetary enterprises and plants; other state organizational units not making amortization deductions; and in addition, social and political organizations and, of course, private persons.

Such a decision, in the specific economic situation, was certainly justified. The basic objectives of the general inventory, and especially the problem of setting in order the costs of production and creating more regular foundations for determining the volume of amortization deductions concern first of all the enterprises under economic accounting. Thus, if it were necessary to limit the program the choice was correct. But, as usual, this decision also has negative consequences. Even now several reservations are brought forward in connection with this, particularly among the employees of central planning organs.

The problem is that the structure of fixed assets determined on the basis of the inventory results will not show correctly the participation of the basic mass of fixed assets in units under economic accounting in the section of transport and in budgetary units in the sections of education, culture, and health. In addition, so far the gross computa-

tions of investment outlays did not take into account the division into units operating according to the principles of economic accounting and budgetary units.

Of course, in the basic sections of the national economy, the subjective scope of the general inventory determined at present will not be an obstacle in utilizing its results for planning and analytical work. However, in the remaining sections it will present an essential difficulty in correcting planning and in making economic analyses more realistic, and--what is of course more important--in these sections fictitious calculations and evaluations resulting from incorrect and incomparable basis of these calculations and evaluations--namely the old valuation of fixed assets--will continue to occur.

Two basic conclusions stem from the above reservations, requiring immediate and concrete decisions.

Firstly, in order to obtain an early possibility for an evaluation of an all-embracing picture of the structure of fixed assets and of comparing the total volume of investments with the value of replacement of fixed assets and the changes taking place in this field in the whole socialized economy, it is also necessary, at least roughly, to evaluate the value of replacement and wear of these fixed assets in the sections which were skipped in the general inventory. However, this will be only a half measure and will settle the problem only partially.

Secondly, besides this "immediate solution," it is necessary to postulate the taking of a general inventory of fixed assets in the possession of the remaining enterprises and organizations in the second stage of the general inventory, which should take place after the final completion and summing up of the work of the present first stage, and therefore at the end of 1960 and beginning of 1961.

If the decision on the second stage is made, it is necessary at the same time to remember the possibility and desirability of immediately switching certain enterprises from the first to the second stage and the other way around. It is simply necessary to ensure an all-embracing inventory of specific branches in sections of the economy in the individual stages of work. If in the given organizational section or setup identical enterprises are operating, differing only in forms of financing or principles of accounting, it would not be proper to take the inventory for only a part of the enterprises of the same branch. For example, in the practice



of enterprises of communal economy three forms of financing occur in the case of similar enterprises--economic accounting, budgetary plant, and a unit in the budget--and these forms result in practice from the size of the enterprise. The problem is that in such cases either the scope of the first stage inventory should be expanded to include all enterprises of this type, or some enterprises under economic accounting should be shifted to the second stage of work. Of course, practical considerations must determine the acceptance of one of these solutions. If the majority of the given branch operates under economic accounting, it will of course be proper to broaden the scope of the first stage to include the remaining enterprises operating according to other principles of financing. In an opposite situation, there is nothing to prevent the exclusion of a certain number of enterprises from the present stage of inventory work.

The Central Inventory Commission (Centralna Komisja Inwentaryzacyjna) has already made several decisions on widening or narrowing the scope of inventory of the second stage of work.

The third matter connected with the scope of the general inventory and its postulated next stage is the problem of private housing buildings. Demands to include in the inventory all housing buildings, including private ones, located within the limits of towns and settlements were voiced from the beginning of preparations for this program. It was intended to obtain, for the first time since the war, a complete picture of the whole housing fund, especially since the division into private and state buildings is of no major importance in the practical activities of the state apparatus. (Of course, the problem concerns housing buildings subordinate to the housing policy, excluding the so-called single-family houses.)

As is well known, repairs on these buildings are financed from state funds, and for this reason all studies of repair needs have for a long time ignored the ownership problems, especially since the ownership setup will in the course of time be subject to important changes (mortgage security for expenditures on capital repairs of private buildings). As a result, the by-passing of private buildings will decrease the value of the results of the general inventory in planning the volume of outlays for repairs, and the picture of the value of buildings and their degree of wear will not only be incomplete but even, in individual wojewodztwos where private buildings constitute over 40 percent of the total housing resources, distorted.

The postulate of including private housing buildings in the general inventory is supported by the majority of the people's councils. Some of them (for example, those in Warsaw and Wroclaw) decided on their own initiative and at their own costs, to take an inventory of all buildings; other wojewodztwo people's councils have this intention.

Thus this problem is also mature for final decision, especially that at the moment a spontaneous starting of work is threatening, which is always more expensive and less effective.

## II

No authoritative answer has so far been given to the question of whether the program is a one-time program. There are also no concrete moves which would show that the general inventory is not a one-time program.

The general inventory is to provide for the first time a kind of photograph of the quantitative and qualitative state of fixed assets in the individual sections of the national economy and an evaluation of the remaining life-span of basic types of fixed assets. It is not necessary to explain in detail the great importance of information of this kind for programming and planning investments, balancing machines and installations, formulating the repair policy, etc. However, it does not seem proper that the general inventory should be taken only once. All chances exist for the opposite to be true.

The results collected in the course of the inventory in enterprises create a possibility for taking advantage of detailed data which at the moment do not even have to be summed up, and create chances for starting a correct management of fixed assets over a longer period of time. This statement follows from the technique used throughout, from the character of documents started during the course of the inventory and the resulting possibilities for keeping them up to date.

For the basic groups of fixed assets (buildings, constructions, machines, technical installations, and means of transport), the so-called inventory sheets will be set up during the general inventory, with rather extensive content, much exceeding the direct objectives of the general inventory. These sheets contain detailed information on the composition,

the state of individual elements, the technical equipment of a project, etc. and leave room for periodically keeping these data up to date. In this way, the inventory documentation will in a sense become simplified certificates of projects and thus may constitute an excellent source for periodic studies, analyses, questionnaires in specific cases, etc., not to mention its role in determining the current operating needs of the enterprises. The problem is that even the best source will not by itself ensure the utilization of the existing possibilities, especially since there is a real danger that the inventory sheets, setup with such effort, will share the fate of dozens of other records.

In other words, we now have a chance to prepare correct balances of fixed assets, the lack of which is reflected to a considerable extent in economic planning. However, the realization of this fact cannot take the place of the absence of several decisions, rather of an organizational nature, which conditions the possibility of starting the balancing work. The problem is that it is necessary even now to determine in a uniform way who is to deal with the preservation and updating of the inventory sheets, and how to do it, and in what way it is necessary to treat new fixed assets reaching enterprises after the inventory as a result of new investments, which data is of basic importance to ensure the completeness and comparability of these balances with the original findings provided by the general inventory.

Of course, there are many more detailed problems of this type. There is a formal rule obliging the Central Inventory Commission to prepare the principles of updating the results of the general inventory. It seems, however, that decisions must be made now, if we do not want to lose this chance. The urgency of this matter stems from the fact that the method of collecting the results of the inventory, which is a matter for the nearest future, must depend on later balancing needs. From this would follow the need for immediate creation of a body responsible for the preparation of periodic balances of fixed assets to be included in the work connected with summing up the results of the general inventory. In addition, decisions concerning the future updating of the results of inventory must thus cause several detailed studies in the field of bookkeeping and technical records of fixed assets. The implementation of such tasks under our conditions is not a simple matter, and, therefore, if we do not want to allow for the emergence of loopholes after the completion of the inventory, they should be solved as soon as possible.

Connected with the problem of balancing fixed assets is one more possibility, so far neglected almost completely. The inventory results will be summed up in two basic treatments--ministerial and local. This last cross-section will permit the creation of a balance of fixed assets in individual wojewodztwos and economic regions and therefore will become an essential aid in the preparation of local plans, a more correct distribution of the economic potential, etc. But the utilization of possibilities of this kind also depends on several decisions starting with such basic matters as a guarantee that the complete inventory results reach the wojewodztwo commissions of economic planning.

In a word, an all-inclusive preparation of the method of current and long-term analysis of utilization of results of the general inventory is needed. And, of course, decisions resulting from such an evaluation.

### III

The possibilities of updating changes in the value of fixed assets subject to inventory and the basic objective of the inventory are inseparably connected with the problem of prices.

As is well known, the present incorrect and nonuniform evaluation of capital assets prevents correct amortization deductions and therefore accumulation from this source of funds for repairs and simple replacement (partial and expanded) of the worn capital. In addition, the nonuniform burdening of costs of production caused by an incorrect or different evaluation of similar projects in individual enterprises resulted in distortion of the calculation of production costs, incomparability of costs, and sometimes even, in extreme cases, fictitiousness of the whole calculation. However, the prevailing rules in the field of the general inventory do not provide for a date, and the prices in which the results of the program will be introduced into the financial and book records. This results from the fact that fixed assets were evaluated during the inventory according to price lists prepared on the basis of prices, norms, and wage rates in force as of 1 January 1956. These prices became obsolete rather a long time ago and the process of their becoming obsolete is constantly deepening, and it is different with regard to the individual groups of fixed assets; for example, the prices of

machines and installations changed differently than those of projects of a construction and assembly nature. As a result, at the time of completion of inventory work, the new evaluation will not correspond to the current price level. The realization of this fact must accompany any considerations on the importance of the program because this problem is of decisive importance for all further work, and especially for the possibilities of utilizing the results of the inventory.

Of course it could be asked why, despite the already effected and expected price changes, it was decided to retain the obsolete principles of evaluation. The answer to this question is rather simple. The secret of the choice of 1956 prices results from the fact that price lists taking into account prices of that year were prepared in the past. It is practically impossible to make such an evaluation according to any current price system. The method of preparation of price lists and other material for the inventory makes it necessary to devote much time to this work. The price movement ignores this time lag. As a result, the race between the price movement and the work on the preparation of price lists for purposes of the general inventory must be lost by the inventory. However, in view of the fact that the most important matter is the uniformity of the evaluation of fixed assets, despite the fact that this evaluation will not be made in prices current on the day of the inventory, the basic objective of the inventory may be attained. However, from this fact follows the urgent need to determine the principles of further systematic changes in the value results of the general inventory, and this too must be one of the main and most urgent tasks of the Central Inventory Commission.

Setting the evaluation of fixed assets at a uniform level, which under our conditions will necessarily be the 1956 level, should be done simultaneously with the preparation of a system of permanent, index-number correction of this evaluation. The quantity of indices of this kind must be differentiated to such an extent sufficient to correspond to every real structural price change in subsequent years. After preparation by the Central Inventory Commission, in accordance with its statutory tasks, of the principles of further updating of the evaluation of fixed assets, it seems necessary to oblige the institution created for the preparation of balances of fixed assets to a permanent, periodic preparation of conversion indices of the replacement value of fixed assets and the duty of making a correction according to these indices by the financial and accounting services of enterprises. The first changes in balances which will take

place directly after the inventory--that is, the results of the inventory should be introduced into the balances in the corrected form and not in 1956 prices. Also, the results of the inventory should be summed up and prepared for analysis in corrected prices.

Only in this way will it be possible to avoid a few years hence a similar situation which made it necessary to conduct the general inventory.

Footnote

<sup>1</sup>Resolution No 12 of R. M. [Rada Ministrow; Council of Ministers] of 5 January 1959 on the taking of a general inventory of fixed assets, Monitor Polski, No 6, item 24.

POLAND

Disclosure of Production Reserves for Proper Investments

[This is a translation of an article by Jerzy Lasocki in Finance, Vol X, No 11, November 1959, Warsaw, pages 20-31; CSO: 3875-N]

The assumptions for the development of national economy in 1959-1965 provide for an increase in outlays for investments, with a simultaneous lowering from 23 percent to 21 percent of the index of participation of accumulation in national income and an increase of 30 to 33 percent in the fund of consumption. The increase in investment outlays is dictated on the one hand by the necessity to create suitable conditions for employing the growing population and on the other hand the need for further economic development of the country.

The implementation of the above-mentioned assumptions of increase in investments will require a thorough analysis of the present utilization of productive and service capacities, aiming at disclosure of the existing reserves of these capacities and their proper management, and therefore at the most rational utilization of resources allocated to investments.

In order to ensure the correct implementation of these targets, new rights and duties were also imposed on the banks financing investments; on this basis the banks will present to the proper authorities opinions as to the desirability of the planned directions of development of given branches of production or services and the volume of financial resources indispensable to attain a given increase in productive (service) capacities or other economic effects.

For banks financing investments, these duties are a new problem, for many reasons difficult to realize. Some time will also be needed to switch the banking apparatus to new directions of economic and control work and to prepare the most proper methods.

Undoubtedly, one of the most difficult operations will be a study of the utilization of existing productive (service) capacities of individual plants and branches--that is, an

element having a basic influence on the desirability of planned directions of investment and volume of investment needs of individual branches of production or services. In principle, so far such studies have not been conducted in Poland on a wide scale and hence there are no practical experiences.

The present study constitutes an attempt to define uniform terms and determine general methods of studying the utilization of productive and service capacities for the needs of the banking apparatus. The methods of study for individual branches of production and services will undoubtedly be arrived at in the course of the practical studies which will be conducted by banks financing investments.

## I. Productive Capacity

The term "productive capacity" does not have a uniform meaning; it is identified with the term "productive potential" and is even used to denote planned or executed production (services). This varied use of the term "productive capacity" distorts the picture of actual productive (service) possibilities of plants and results in excessive burdening or incomplete utilization of means of work, incorrect determination of investment needs, etc.

The discussed terms apply to the following equipment: a) machines and installations, b) productive space, c) means of transport, d) warehouse space.

From the point of view of the criteria used to define the terms mentioned here, it seems proper to accept the following ones:

1) Productive potential is a theoretical magnitude corresponding to the technical potential of the equipment, expressing the maximum quantity of production (services) which an enterprise can obtain in a unit of time. For example, a machine tool for metals or wood has properties characteristic of this kind of productive installations, such as engine power, speed of cutting, speed of movement, position of teeth, etc.; trucks, cars, buses, freight and passenger railroad cars have such properties as nominal loading capacity, number of seats, etc.; buildings and productive (service) premises and warehouses are, for example, characterized by total floor space. These properties characterize the productive potential of the equipment.



The productive potential of the equipment is determined in advance by the author of their designs and his executor and corresponds to the maximum possibility of utilizing them. The term productive potential applies to both individual components (machines aggregates) and to the division and the plant. Instead of the term productive potential, such terms as long-term productive capacity, theoretical productive capacity, technical productive capacity, etc.

2) Productive capacity is a practical magnitude corresponding to the optimum volume of production which can be realized in a unit of time under given organizational and technical conditions. Such a unit of time is in principle a year, since it constitutes a closed period of planning and realization of production.

For technical and organizational reasons, means equipment and especially machines, installations and means of transport--cannot be operated for a longer period of time with full utilization of its productive potential. Continuous operation of equipment according to maximum productive potential is impossible for reasons resulting from its construction and the requirements of the technological process. For example, the insertion or removal of objects of work from machines, the setting and regulation of the work of machines, replacement of tools, etc. constitute breaks of a technological nature. In addition, there are breaks on an organizational nature resulting from the system of work of the plant (for example, one- or two-shift work), breaks for holidays, idle periods during repairs of machines, etc. For this reason the real magnitude of productive capacity must be calculated by taking into account the unavoidable technological and organizational breaks, if it is to be a realistic measure of productive potential.

Organizational and technical conditions may apply to the whole industry, branch, enterprise, division, and each working post. In the cross-section of the whole industry or branch, they will first of all be problems of the level of specialization and organization of cooperation, determining the rational distribution of production between enterprises, permitting their specialization and organization of mass production. With regard to enterprises, these conditions are external conditions. Among the internal conditions, we should count first of all the quantity of machines and the productive space of the enterprise, and the level of skill of the personnel--that is, the degree of its command over the technique and organization of production. On the quantity

and type of equipment at hand depend the maximum possibilities of starting the proper technological operations and utilization of productive space. On the other hand, the proper command by the personnel of the technique and organization of production determines the intensity of utilization of equipment--that is, the effective labor productivity in the unit of time. The productive capacity of an enterprise should be calculated for each kind of product. The magnitude of productive capacity may be expressed in natural units (e.g., square meters, tons, units) or theoretical units (e.g., megawatts of turbines, horsepower of steam engines). In certain cases the productive capacity may be defined as the magnitude of the fund of time of work of machines and installations. The idea of productive capacity applies to the individual components of the equipment, and to the working post, division, and plant. Productive capacity potential denoted by the term long-range, theoretical, technical productive capacity, is also called optimum productive capacity, practical productive capacity, effective productive capacity, etc.

## II. Reserves of Productive Capacity

There are various methods of calculating productive capacity in individual branches of production and services, and even in plants, according to realized production or services. In connection with this, the productive capacity should be analyzed in close conjunction with the type and specific nature of production (services) and the produced commodities. The calculation of the productive capacity of major productive links is the magnitude of the productive capacity of the basic assembly or machine (so-called leading one), which sets the pace and determines the system of work for the whole link.

The productive capacity of the working post is a variable magnitude; it increases with the intensification of the technological process (increase in labor productivity) and fuller utilization of extensive reserves (duration of work of machines). The productive capacity of the working position (group of identical positions) can be calculated in accordance with the following formula:

$$Z = \frac{T}{t}$$

where  $Z$  = productive capacity expressed in natural units of production

$T$  = effective fund of working time of the post in the accounting period (year, month, shift)

$t$  = labor absorption of execution of a unit of product on the given position.

With an increase in the effective fund of time and a decrease in labor absorption of the product, the productive capacity increases, and conversely. In planning and statistical terminology, a distinction is made between the calendar, nominal, and effective time fund:

a) The calendar time fund means the calendar number of hours, calculated for the work of the machine in three shifts on all days of the year, and it is equal to  $365 \times 24 = 8,760$  machine hours.

b) The nominal time fund means the number of hours of work of the machine, taking into account the existing system of work (shifts), and the time free from work on Sundays and holidays, and the shorter work day on Saturdays; for example, with a three-shift system of work the nominal time fund will be  $8,760 - (61 \times 24 + 52 \times 6) = 6,984$  machine hours (in certain branches of industry, the calendar and nominal time funds are identical).

c) Effective time fund means the number of hours of work of the machine obtained by deducting from the nominal time the time scheduled for planned repairs and possible other planned idle periods.

The fund of working time of an assembly of machines (working post) results from the quantity of machines installed and the calendar, nominal, and effective working time corresponding to them.

In calculating the productive capacity of a division or of a whole plant it is not possible to use the sum of effective working time of various working posts because this will lead to erroneous results.

The labor absorption per unit of product may be expressed in hours:

- a) actual--that is, on the basis of results attained;
- b) planned--that is, accepted for the determination of the productive capacity planned for the execution of the production plan;
- c) technical progressive norms--that is, taking into account elements of organizational and technical improvements.

Of course, for the calculation of productive capacity we must use not the results of actual labor absorption but the technical-progressive norms. These norms express the maximum productivity of a given machine and installation during a specific unit of time which can be attained by leading workers using the latest technological processes and a rational organization of work and production.

The productive capacity of the division or plant can be defined only on the basis of an analysis of the productive capacities of individual working posts.

As a result of such an analysis, it is possible to determine the internal disproportions of productive capacities (bottlenecks, surpluses) which will require proper decisions as to the removal of bottlenecks or utilization of reserves. In accordance with this it is possible to determine the correct productive capacity of a division or plant.

An analysis of the productive capacity and its utilization should concern the individual components, groups, and types of equipment, influencing both directly and indirectly the volume of productive capacity--that is, machines and installations, productive space, means of transport, and warehouse space.

Of special importance for productive capacity are productive machines and installations with the aid of which the workers directly influence the objects of work. For this reason, studies on the correctness of determining the productive capacity, the study should concern extent and intensity of utilization of machines and installations--that is, utilization of the fund of time of work in the first instance and labor absorption of products in the second instance.

Among the reserves of extent of utilization of machines and installations, the following should be included:

- a) incomplete utilization of the working day because of waiting for material, collection of documentation and tools, preparation of machines for work, etc.

b) incorrect organization of repairs, and first of all prolongation of the idle time of machines and installations under repair;

c) incomplete manning of posts caused by absenteeism of workers.

Among the reserves of intensity of utilization of machine and installations we should include the following:

a) reserves inherent in designs of products--that is, possibilities for decreasing the labor absorption of their production while retaining the assumed prices and properties in use;

b) reserves inherent in the technological process--that is, the possibility of switching to more productive technological processes;

c) reserves inherent in the organization of productive processes--that is, possibilities for using, for example, flow lines;

d) reserves in individual labor productivity of workers stemming from the level of their skills, wage systems, etc.

A study of utilization of the working time should be conducted with the aid of a balance of the working time of machines and installations. Such a balance, prepared for individual machines and installations or for larger assemblies include, for example, the following data (Table 1):

Table 1

I. Number of Machines (Installations)	II. Number of Machine-Hours (Installed Machines)
1. Available	1. Calendar
2. Installed	2. Nominal
a) active	3. Effective
b) inactive	4. Actually worked
c) under repair	a) on one shift
3. In reserve	b) on two shifts
	c) on three shifts
	5. Idle periods
	a) planned repairs
	b) breakdown repairs
	c) inadequate power
	d) inadequate supplies
	e) inadequate personnel
	f) other causes

The layout of the balance may take into account planned and executed data.

The degree of utilization of machines and installations should be measured with the aid of various parameters. Only multilateral studies will permit a proper determination of reserves of extent of utilization. Such studies will permit the determination of the following coefficients:

[a] Coefficient of operation, calculated as the ratio of the number of machines (machine-days or machine-hours) installed to the number of machines (machine-days, machine-hours) available; thus, this coefficient can be calculated according to the following formula:

$$We = \frac{Mz}{Mp}$$

where We = coefficient of operation

Mz = number of machines (machine-days, machine-hours) installed

Mp = number of machines (machine-days, machine-hours) available

[b] Coefficient of repairs, calculated as the ratio of the number of machines (machine-days, machine-hours) under repair to the number of machines (machine-days, machine-hours) installed; this coefficient can be calculated according to the following formula:

$$Wr = \frac{Mr}{Mz}$$

where Wr = coefficient of repairs

Mr = number of machines (machine-days, machine-hours) under repair

Mz = number of machines (machine-days, machine-hours) installed

[c] Coefficient of technical efficiency (readiness), calculated as the ratio of the number of machines (machine-days, machine-hours) available for use to the number of machines (machine-days, machine-hours) installed; this coefficient can be calculated according to the following formula:

$$Ws = \frac{Ms}{Mz}$$

where  $W_s$  = coefficient of technical efficiency (readiness)  
 $M_s$  = number of machines (machine-days, machine-hours)  
available for use  
 $M_z$  = number of machines (machine-days, machine-hours)  
installed

In this case:

$$W_s + W_r = 1$$

[d] Coefficient of utilization of machines and installations, calculated as the ratio of the number of machines (machine-days, machine-hours) active to the number of machines (machine-days, machine-hours) installed; this coefficient can be calculated according to the following formula:

$$W_w = \frac{M_w}{M_z}$$

where:  $W_w$  = coefficient of utilization of machines and installations  
 $M_w$  = number of machines (machine-days, machine-hours)  
active  
 $M_z$  = number of machines (machine-days, machine-hours)  
installed

The above coefficients can be calculated with regard to the number of machines or the time fund corresponding to them--that is, machine-days or machine-hours. In the case of calculations made according to machine-days or machine-hours to determine the coefficients of operation, repairs, and technical efficiency, it is necessary to use the calendar or nominal time fund. The coefficient of utilization of machines should be calculated according to all three kinds of time fund--calendar, nominal, and effective--that is, as a ratio between the number of actually worked machine-hours and the calendar, nominal, and effective fund of working time.

The study of utilization of the time of work of machines and installations should also include a study of shifts. The coefficient of shifts is the ratio of the number of active machines or the number of machine-hours worked in all shifts to the number of active machines or machine-hours worked in the largest shift. The determination of this coefficient is based on the principle that in the largest shift the productive capacity of machines and installations is best utilized, and represents a certain maximum of practical utilization of

the quantity of machines and their time of work. The coefficient of shifts can be calculated with relation to individual groups of machines and to the total quantity of machines. With a three-shift system of work the coefficient of shifts, with full realization of the system, is 3, and with a two shift system it is 2. In analyzing shifts, the following problems should be examined:

- a) desirability and possibility, for organizational and technical reasons, of increasing the utilization of machines by means of intensified shifts;
- b) desirability of increasing the utilization of machines in view of the volume of production demanded;
- c) effectiveness of work on the third shift, taking into account the lower labor productivity at night, additional costs of maintaining operations, etc.

Apart from a study of the extent of utilization of machines and installations, the studies should include the degree of intensity of utilization. The coefficient of intensity of utilization of machines and installations can be calculated as the ratio of the real average volume of production per given unit of time to the optimum productive capacity of investigated machines and installations in the same unit of working time. In calculating this coefficient for machines or their assembly with homogeneous production, it is possible to use natural units of measurement; on the other hand, under conditions of heterogeneous production, it is necessary to use values in monetary units. The coefficient of intensity of utilization of machines and installations is calculated according to the following formula:

$$W_{intens} = \frac{P_{real}}{P_{opt}}$$

where  $W_{intens}$  = coefficient of intensity of utilization of machines

$P_{real}$  = real production per unit of working time

$$P_{real} = \frac{\text{real production in investigated period}}{\text{time worked in investigated period}}$$

$P_{opt}$  = optimum production per unit of working time

$$P_{opt} = \frac{\text{optimum production in investigated period}}{\text{effective time of work in investigated period}}$$



The unit of the time of work according to which the intensity of utilization of machines and installations is to be calculated should be a period connected with a minimum uninterrupted period of work (for example, one machine-hour) or with a time of execution of a specific production process (for example, one smelting).

In an analysis of the productivity of machines and installations, it is necessary to take into account the fact that the indicators of productivity are not and cannot be constant but that they change under the influence of technical progress and technological changes in production and constant improvement in skill of workers and improving organization of work.

An important factor in the utilization of productive capacity of a plant is--apart from the degree of utilization of machines and installations--the utilization of the productive space. The productive space of a plant applies to mechanical, assembly, and other divisions (working posts). The size of the productive space of mechanical divisions depends on the following factors:

- a) quantity of machines and installations installed
- b) space norms per machine
- c) space norms for internal transport and storage of objects of work (materials, prefabricates, etc.)

A study of the utilization of productive space can be made, for example, in the following way (Table 2):

Table 2

Division (Working Post)	Number of Machines	Total Space Meters <sup>2</sup>	Norm Productive Space, M <sup>2</sup>	Actually Occupied Space M <sup>2</sup>
X	5	50	30	40

On the basis of the above computation, it is possible to calculate the following coefficients for the individual divisions and for the plant as a whole:

[1] Coefficient of standard use of total space as the ratio of the norm productive space to the total space.

[2] Coefficient of utilization of norm productive space as the ratio of the actually occupied productive space to the norm space.

Apart from these two coefficients determining the degree of utilization of total space and observance of space norms, the coefficient of utilization of the average norm productive space per machine, which is the ratio of the average actual productive space per machine to the average norm can also serve for the determination of reserves of productive space.

The productive capacity of assembly divisions particularly depends on the size of the productive (assembly) space and the intensity and extent of its utilization. Three basic methods of assembly are distinguished: on the floor, on a table, and on a belt.

With assembly on the floor, the productive capacity of an assembling division (in units of product) can be calculated according to the following formula:

$$Z = \frac{TS}{ts}$$

where: Z = productive capacity in units of products  
 T = effective fund of working time in hours  
 S = production space of assembling division in square meters  
 t = norm time of assembling one unit of product, in hours  
 s = productive space occupied by one assembled product and passages indispensable for work, in square meters

(ts is calculated for each stage of assembly executed at one assembly post in order to determine the capacity of individual sectors and to detect bottlenecks).

With assembly on tables, the calculation of the productive capacity is made in the same way as for assembly on the floor. The productive capacity of an assembly belt is calculated in the same way as the productive capacity of machines and installations. The extent and intensity of utilization of the productive space of assembly divisions is studied in a way similar to that given above for machines and installations, with the difference that the fund of time of work of each post and the entire assembly division is calculated in space-hours (square meter-hours) and not in machine-hours.

Among the most important reserves of freeing unproductively utilized space for productive purposes is switch to flow production, strict norms on auxiliary space for warehouses,

offices, and similar installations located in the same premises as production and assembly division; and correct determination of norms of space for individual machines and installations, and also space indispensable for assembling products.

Means of transport constitute the main factor in passenger and freight transport enterprises and an important factor in industrial, commercial, etc. enterprises, on which the size of productive capacities depends. Studies to date have shown that the quantity of means of transport possessed by enterprises, especially of trucks, is not always justified by the quantity of goods transported--which of course causes incorrect coefficients of utilization of rolling stock and economic indicators--and is also in contradiction to the principle of economical management of investment resources, which in this way are frozen in a superfluous quantity of means of transport.

For this reason studies of the utilization of means of transport should be undertaken with special care.

The volume of transport services may be defined both statically and dynamically.

As in the case of machines and installations, a convenient instrument for an analysis of the work of transport is the balance of the time of work of means of transport prepared for individual types of transport means.

In studying the utilization of means of transport, the above discussed indicators of repairs, efficiency (technical readiness), and utilization of rolling stock can also find application.

The carrying capacity of means of transport is measured in terms of nominal loading capacity--that is, according to the technically determined permissible loading capacity. The utilization of this capacity is defined as the ratio of actual load to the nominal loading capacity. Static and dynamic loads are distinguished.

The static load is defined as the volume of total of loaded goods. The concept of dynamic load includes the volume of the total of goods loaded and the distance of the haul, and in this way it concerns the volume of the transport work executed.

Apart from the above data characterizing the total static load and the total dynamic load, the idea of average load is also used:

[a] the average static load is calculated as the ratio of the total static load to the number of transport units loaded (e.g., freight cars, trucks) and can be expressed according to the formula:

$$Z_{\text{stat}} = \frac{\text{loaded tons}}{\text{trucks}}$$

[b] the average dynamic load is calculated as the ratio of the total dynamic load to the hauling distance covered by the loaded transport units (e.g., freight car-kilometers, truck-kilometers) and can be expressed according to the formula:

$$Z_{\text{dyn}} = \frac{\text{ton-kilometers carried}}{\text{truck-kilometers covered}}$$

Apart from the volume of the static and dynamic loads, the utilization of means of transport is characterized by the coefficient of utilization of carrying capacity calculated as the ratio of the actual load to the nominal loading capacity in static and dynamic treatment. The coefficient of utilization of carrying capacity can be calculated not only for individual transport units but also for the entire rolling stock. The coefficient of utilization of carrying capacity is therefore calculated according to the formula:

$$W_{\text{hauls}} = \frac{\text{transport work}}{\text{carrying capacity of individual means of transport runs corresponding to them}}$$

Studies of the utilization of means of transport can also concern such problems as:

- a) average distance of hauls
- b) type of goods transported
- c) direction of transport
- d) dynamics of hauls, etc.

The above given directions of studies of utilization of means of freight transport also apply to means of passenger transport.

Warehouse space does not constitute a factor directly determining the magnitude of productive capacity of a plant. Nevertheless, disclosure of reserves in the utilization of warehouse space is of great importance for the full utilization of

existing productive capacities and their increase, for example, by utilizing superfluous warehouse space for production purposes and also for the proper utilization of resources destined for investments.

The study of utilization of warehouse space concerns warehouses for raw materials, materials, and semifinished products required for production and warehouses for finished products.

The size of warehouse space depends on the following factors:

- a) quantity norms of stocks of raw materials, materials, and semi-finished products according to their type and composition;
- b) quantity norms of stocks of finished products;
- c) space norms per unit of stocked raw materials, materials, and semifinished products;
- d) space norms per unit of finished products stocked;
- e) space required for internal transport.

The degree of utilization of warehouse space of individual warehouses is evaluated from the point of view of observance of the above-mentioned factors. On this basis the following coefficients can be calculated:

[a] Coefficient of norm use of warehouse space as the ratio of norm warehouse space (corresponding to the quotient of the quantitative norm divided by the space norm) to the total warehouse space.

[b] Coefficient of utilization of norm warehouse space as the ratio of occupied warehouse space (constituting the quotient of the average quantity of raw materials, materials, semifinished products, or finished products stocked in the period under study divided by the space norms corresponding to them) to the norm warehouse space.

The most frequent source of reserves of utilization of warehouse space is the incorrect determination of quantity or space norms and failure to observe these norms.

### III. Investment Needs and Utilization of Productive Capacities

The successful fulfillment of the assumptions of development of the national economy in 1959-1965, which provide for an increase in outlays for investments and a simultaneous lowering of the share of accumulation in the national income, depends to a large extent on the full mobilization of the productive reserves and on the rational utilization of resources destined for investments in the material sphere--that is, on the desirability and economic effectiveness of investments.

The problem of desirability of investments in the material sphere is inseparably connected with the existing productive potential, with its utilization and reserves. The investment needs of a plant or branch of production stem mostly from the following elements:

- a) planned productive targets and productive services;
- b) existing productive capacities;
- c) planned losses of productive capacities in connection with the wear and liquidation of equipment;
- d) indispensable reserves of productive capacity in cases of seasonal production.

The magnitude of the planned tasks of production and productive services determines the productive capacities required for the execution of these tasks.

A comparison of existing productive capacities, taking into account planned losses and the necessity of retaining certain seasonal reserves, with the need for productive capacities stemming from the planned production and service tasks makes it possible to determine surpluses or shortages of productive capacities.

Such a comparison should be made for individual types of productive capacities, with a proper distribution for each plan year. A balance of the productive capacities prepared for individual plants and for each branch of production may serve for this purpose.

The productive tasks for the plan period determine for a branch of production are allocated for realization to individual plants of the branch and are contained in the production plans of these plants. Productive capacity should therefore be balanced first in the productive plants, and only on the

basis of plant balances of productive capacity may a proper balancing on the branch level be made.

The balance of productive capacities of a plant will make it possible to determine the reserves and bottlenecks of production in individual divisions and to determine the productive capacity of the whole plant. For example, in the case of existing disproportion between the cooperating divisions, these reserves will depend on the productive capacity of the division at its lowest level; where there are no ties of production between divisions, they will depend on the productive capacities of the individual divisions.

In the case of internal cooperation, the determination of the productive capacity of the whole plant for purposes of balancing the productive capacities on the branch level should take into account data concerning divisions with the lowest (minimum) productive capacity as well as data concerning divisions with the highest (optimum) productive capacity. This will permit making correct decisions as to the possible utilization of reserves or liquidation of shortages of productive capacities in the plant.

Where there is no internal cooperation, the productive capacity of the plant in the branch balance should be entered according to the actual productive capacity of divisions. For example:

Table 3

Plant	Production Plan	Productive Capacity		Surplus of Productive Capacity		Shortage of Productive Capacity	
		Optimum	Minimum	Optimum	Minimum	Optimum	Minimum

The balance of productive capacity of the branch will make it possible to determine surpluses of shortages of productive capacities in the individual plants and jointly for the whole branch. According to the results of balancing, correct decisions may be taken concerning:

a) transfer of planned tasks between plants in case there is equilibrium on the branch level but not in individual plants;

b) necessity of increasing planned tasks or starting new production where there are reserves of productive capacities on the branch level;

c) supplementing, by means of investments, a shortage of productive capacity in individual plants.

In the first two cases no investment is needed, in view of the possibility of full utilization of existing productive capacities for the execution of planned tasks.

In the third case the finally determined shortage of productive capacities of the branch may be liquidated by renovation, modernization, or expansion of existing plants, or the construction of new plants. Proper decisions in this field should be made as a result of a calculation of the economic effectiveness of investments.



## POLAND

### Transportation Investment Plan for 1960

[This is a translation of an article by Aleksander Nowakowski and Mieczyslaw Partyka in Przegląd Kolejowy, Vol XII, No 2, February 1960, pages 44-47; CSO: 3786-N]

The tasks of the Department of Transport (Resortu Komunikacji), as established in the investment plan for 1960 were determined by the requirements of the production and service enterprises of the department and by the necessity of adjusting transport installations to the requirements of proper servicing of the newly created or expanding enterprises of other departments.

The transport tasks set for all types of surface transport facilities for 1960 are expressed in the figure of 315.5 million metric tons of freight and 1,251.4 million passengers. The division of these tasks between various types of transport facilities is shown in the following table. Railroad transportation dominates the picture, although motor-vehicle transport is showing steady rise.

Type of Transport	Freight Transport	Passenger Transport
	(in percent)	
Total	100	100
Normal-gauge railroads	82.4	72.2
Narrow-gauge railroads	4.1	2.5
State Motor-Vehicle Transportation	13.5	25.3

The investment plan for 1960 represents a part of the 1956-1960 Five-Year Plan. It can therefore be considered as a final stage of the execution of long-term tasks on one side, and as a preparation for investment tasks of the next Five-Year Plan on another. This means that several investment tasks foreseen in the plan will influence the economic achievements of 1960, while the other part of the planned investments are to secure a rise in the capacity of production and services of enterprises of the Department of Transport during the initial phase of the plan for 1961-1965.

In preparing the investment plan, the following were the basic aims.

1) To ensure in more rigorous ways than before the possession of an approved documentation of cost of a given project at the stage of preparation of a working draft (or drafts) of investments stipulated by the plan.

2) To concentrate investments, expenditures on avoiding delays or even accelerating the delivery of finished investments and reducing the possibility of having funds frozen in the construction work; these targets can be achieved through giving priority to:

[a] continued investments which were started during previous years; efforts must be undertaken to transfer for operation some parts or whole groups of investments;

[b] new investments which can be completed during one year;

[c] investments which are important for the operation of enterprises that can quickly produce substantial economic results

3) To provide funds needed to secure the execution of investments that are important for the national economy and are based on the resolutions of the Council of Ministers and other legal acts or on decisions of the Ministry of Transport.

4) To eliminate new investments from the current plan if such steps are economically sound.

5) To promote close cooperation between investment activities and proper management of fixed assets of enterprises in general, especially to restrict centralized investments for the benefit of decentralized investments.

6) To consider as widely as possible the recommendations of factory crews to the Third Congress of the PZPR, [Polish United Workers' Party].

7) To secure full conformity of the scope of investments with the funds stipulated in the plan.

8) To observe the conditions of maintaining the requirements for machinery and materials according to the practical possibilities of obtaining supplies.

9) To rigorously observe the obligatory construction cycles and permit deviations only in exceptional cases justified by the specific conditions of a given investment.

10) To secure the achievement of tasks by the executive branch of investment projects.

It must be stressed that for the creation of the most correct conditions for the execution of the plan, representatives of the main and local branches of the Investment Bank participated in the preparatory work. Their participation consisted mainly of expressing opinions regarding planned tasks, based on experience obtained in the execution of the investment plan of the Department of Transport in 1959.

During the final stage of preparation of the plan steps were taken to concentrate additional funds for centralized investments. This was based on Order No 42 of the Chairman of the Planning Commission at the Council of Ministers of 19 November 1959.

In execution of this order, the draft of the investment plan was analyzed with the following results:

[1] The number of new investments was further reduced during the last year of the current Five Year Plan.

[2] Funds for continuation of started investments were increased (in some cases doubled in comparison to initial figures).

[3] The number of investments to be finished in 1960 will begin to produce additional economic effects during the current year but not later than in 1961 will be increased.

[4] Fewer funds will be used for investments extending over a period of several years.

[5] Construction and assembly jobs will be more concentrated.

The following concrete results were obtained by the executing of the above-mentioned Order of the Council of Ministers:

a) The number of new constructions was reduced from 589 to 383--by 206.

b) Funds for constructions already started were raised by about 409 million zlotys.

c) Frozen funds connected with investments were reduced by more than 620 million zlotys, which resulted in a reduction of the index of investment commitments to 2.8 by the end of 1960, whereas on 1 January 1960 this index was 3.4.

These results show that, although the conditions permitting the introduction of investment projects into annual plans were systematically fostered, the tendency to stress investments not sufficiently prepared for execution and to extend construction cycles without any justification prevailed among the investors.

The investment plan for 1960 of the Department of Transport includes the expenditure of about 5.9 billion zlotys for centralized and decentralized investments. For construction and assembly work, funds of over 2.4 billion zlotys were stipulated, or about 41 percent of the total allocation. The rest goes to investment purchases and other expenses.

The share of some important transport enterprises in investment expenditure is shown by the following (approximate) percentages:

1. Polish State Railroads	71.0
Local railroads	2.4
2. Public state roads	11.0
3. State Motor-Vehicle Transportation	7.6
4. Polish State Airlines, "Lot" and Administration of the Construction of Commercial Airports (Zarząd Rezbudowy Lotnisk Cywilnych)	1.0
5. Enterprises of industrial character	7.6
6. Construction and assembly enterprises	1.0
7. Other service enterprises	0.8
Total	100.0

Among the main investments of the Polish State Railroads (Polskie Koleje Państwowe) are purchases of rolling stock (freight cars or coaches and locomotives); electrification of some sections of the railroad line and important junctions; reconstruction of important stations and junctions; construction of new railroad lines; construction and reconstruction of buildings at railroad stations; construction of housing, reconstruction of bridges and construction of railroad and road crossings at various levels (especially in towns); modernization of traffic security installations; installations for mechanization of labor-consuming work, etc.

The investments planned for 1960 will favorably influence the work of PKP enterprises and raise the standard of railroad services. This will be expressed first of all in the number of available units of rolling stock, which will be extended by the purchase, of 380 coaches, of which 140 are for long-distance travel and 240 are for suburban connections, 26 are electric units composed of three coaches each, and 50 are motor coaches with Diesel engine. About 9,500 freight cars of various types will be purchased: 32 electric locomotives of Polish manufacture and 33 Diesel engines, 52 coaches, and about 663 freight cars.

The electrification of additional sections of railroad lines will extend the total length of electrified lines by 72 kilometers. Together with the beginning of operations on sections electrified during the preceding years, the progress of electrification of the railroads will create convenient and speedy connections between Katowice and Wrocław via Strzelce Opolski, between Katowice and Tychy via Murcki, between Warsaw and Kutno, and in the region of Kraków--among others, between Kraków and Wieliczka, Niepolomice, and Nowa Huta via Podleże.

As regard the reconstruction of stations and junctions, the plan considers the acceleration of final work at the station of Malaszewicze at USSR frontier station; important reconstruction of the Nowa Huta, Hurko-Medyka, Prokocim, and further reconstruction of tracks in the lignite basin at Turoszów; reconstruction of several Trzebinia stations; stations as foreseen in the small modernization of the Katowice DOKP [Dyrekcja Okręgowa Kolei Państwowych; District Administration of State Railroads], and several other projects.

It is planned to continue, among other investments, the construction of the Sokolka-Kamienna Nowa and Rzeszów-Kolbuszowa railroad lines. It is expected that operations will start on the Rzeszów-Głogów sections of these lines and probably Sokolka-Sidra sections.

The program of modernization of technical equipment and installations of the railroads, especially regarding the security of traffic and communication, stipulates the construction of automatic blocks on further sections of the Warsaw-Katowice line (Grodzisk Mazowiecki-Częstochowa); during the current year this installation will already be in operation on the Grodzisk Mazowiecki-Koluszki and Piotrków-Częstochowa sections. Besides this improvement, modern switching installations (DUN) will be introduced on the section of the Otwock-

Pilawa and Gdansk-Sw. Wojcieck lines. Work will be continued at several stations on the installation of other modern indirect switches. It is expected that they will already be in operation during the current year at the following stations: Czestochowa Towarowa, Szczakowa, and Wolomin.

As for the construction and reconstruction of bridges and viaducts, the plan considers projects which would produce economic effects during 1961-1963. The first construction of this group to be operated will be the bridge over the Bug River at Wyzkow, which will be ready by the middle of 1961.

Systematic efforts toward improvement in the servicing of passengers will be displayed in a consistent--although perhaps still too slow--reconstruction of station buildings. Ready for use will be the following station buildings: Chelm, Rejowiec, Stawiany, Pincz, Wolsztyn, Lapy, Bogumilowice, etc.--a total of 13 constructions.

The housing needs of railroad workers will be at least partially satisfied by the construction of 4,200 rooms in apartment houses. This is not much, but it represents an improvement in comparison to previous years.

Besides the above-mentioned more important results of investments in 1960, the railroad will benefit from other smaller but also important improvements. Installations which will eliminate heavy manual work must be mentioned first. The index of the current and periodical exchange of rails by the use of mechanically equipped trains will grow from 71 percent in 1959 to about 78 percent in 1960. This and other mechanical improvements in the field of conservation of tracks will allow a saving in wages of 380,000 working days. The increasing purchases of such installations as containers of 2.0 to 4.5 cubic meters, movable cranes, electric carts, trailers, etc. indicates that the level of mechanization in traffic operations will be raised from about 28 percent in 1959 to over 31 percent in 1960. More mechanization will also be introduced for loading fuel on locomotives, cleaning locomotives of slag, and in the workshops.

As for public state roads, the following investments will be stressed: the construction of 161 kilometers of new roads with improved surfaces, the reconstruction and modernization of about 113 kilometers of roads, the construction of bridges with a total length of 3,348 meters, and the provision of supplies of materials needed for the conservation of roads and bridges and for their reconstruction on a smaller scale.

At the enterprises of the (Panstwowa Komunikacja Samochodowa) State Motor-Vehicle the main effort will go to increasing the rolling stock and in a lesser degree toward the creation of reserves of supplies.

The investment expenditure for 1960 was earmarked for the purchase of 1,050 trucks, 100 tractors, and 300 trailers.

For passenger service, 985 buses will be purchased, of which 725 are of the "San" type, of Polish manufacture. These deliveries will contribute to the further development of PKS and will facilitate the initiation of services to localities not yet connected to the bus network.

The PKS is constructing several bus garages, and during 1960 work is expected to be completed and operations started at: Wejherowo, Stargard, Nysa, Rybnik, Piotrkow, Trybunalski, Bytom-Lagiewniki, Radom, Augustow, Przemysl, Walbrzych, Pulawy, Busko-Zdroj, Ostroda, and Minsk Mazowiecki. Work will be continued on the construction of garages at Kielce and Zakopane.

Civil aviation will be equipped with several new installations for servicing passengers and to ensure flight safety. Some smaller construction and assembly work will be undertaken at the airports of Warsaw-Okecie, Krakow, Poznan, and Wroclaw.

Among the important investments in other sections of the Department of Transport, quite apart from the purchase of equipment which will increase productivity and widen the scope of services of various enterprises, the following new constructions must be mentioned:

Plant producing prefabricated iron-concrete ties (pre-stressed ties) at Bogumilowice.

Plant for renovation and repair of train safety installations at Zielonka near Warsaw.

Termination of work on projects connected with production at the Minsk Mazowiecki [Zaklady Naprawcze Taboru Kolejowego; Plants for Repairs of Railroad Rolling Stock].

Construction of the building for casting and forging at the ZNTK in Ostrow Wielkopolski; the building will be ready for the assembly of installations.

Modern foundry at the ZNTK in Nowy Sacz.

Part of the second production building at the factory for railroad signals in Zory.

Two automobile servicing stations at Bialystok and Rzeszow.

The "Europejski-Orbis" hotel in Warsaw with 422 beds and part of the restaurant installations.

Hospital with 350 beds for railroad men at Warsaw-Miedzylesie.

About 2,100 rooms in apartment houses, besides the previously mentioned housing plans of the PKP.

It may be useful to stress that the investment plan for 1960 was built on more correct and economic principles than the former plans. This allows us to assume that it will be executed in a much better way from the viewpoint of both investors and executors.

The withdrawal from the plan of several new projects, which had to be transferred to 1961 because they were not sufficiently well prepared, is not harmful to transport operations. Transfer of these projects to the plan for the following year does not mean that their operation will be delayed. By reducing such negative phenomenon as dispersion of construction projects in various places during one year, greater assurance is gained that the construction projects will be ready in time and that favorable economic results will follow.



## RUMANIA

### Activity of the Lumber Basin of the Port of Galati

[This is a translation of an article by D. Zvoranu in Revista Transporturilor, Vol VII, No 1, January 1960, Bucharest, pages 38-41; CSO: 3745-N]

Basically, the activity in the lumber basin of the port of Galati consists in the execution of operations for loading and transporting timber and wood products to and from railway cars and river or maritime ships. This merchandise is destined for export.

To facilitate handling operations, the following are found in this zone:

- [1] an excavated basin with an area of about 10 hectares and with access to the Danube;
- [2] natural and artificial wharfs along the banks of the Danube and the sides of the Basin, divided into 25 sections of 60 to 80 meters, called "appointments for vessels coming along side" (dane de acostare a vaselor);
- [3] platforms for depositing timber, improved by paving and with narrow- and standard-gauge (normal si largi) railways, extending from the bank to the interior of the zone;
- [4] warehouses for storage of finished wood products;
- [5] networks for electric lighting and power and for supplying water and drainage;
- [6] administrative and social buildings;
- [7] piers (extacades) for docking vessels;
- [8] mechanized equipment, including electric- and motor-driven winches, tractors, trailers, etc.; a garage for machinery and a group of repairmen.

The lumber basin of the port has its local management, which distributes annually and monthly a production plan and an internal financial plan; however, it is not organized into a rational administration.

The basic means are supplied permanently, or periodically if necessary, from funds of the Regional Directorate of River Navigation at Galati (Directiei Regionale a Navigatiei Fluviale Galati--DRNFG). Between 20 and 25 percent of the total basic means are used in this zone.

The relations in the receiving process (deposition and expedition of merchandise) are as follows: "Romtrans" Administration has local responsibility for relations with foreigners; the deposition, custody of merchandise, and prestation fees belong to the Directorate of Wood Export (Directia "Export-lemn"), DRNFG is the collector of prestations.

Among the prestations, railroad organs make available and transport railroad cars.

Lately, the sorting of timber is done by "Exportlemn."

On the average, during the last two years about 45 percent of the total of workers and mechanics of the DRNFG have been used in the lumber basin; the volume handled, however, is only 20 to 25 percent of the total volume realized by the Directorate because operations with lumber general have low productivity (in tons per man-hour).

The merchandise which is handled under current methods consists of:

- Packaged or bulk resinous lumber
- Lumber and blocks of deciduous wood
- Railroad ties
- Finished or semifinished wood products, such as furniture, cases, casks, flooring, veneers, plywood, etc.

The most frequent operations are:

- [1] unloading from railroad cars, transportation up to 80 meters, placing in stacks or warehouses;
- [2] loading and unloading trailers, transportation by tractor, and unloading into stacks;
- [3] sorting of stacked materials and placing them in smaller stacks, rounding off of degerated (desfacute) stacks; rarely, the consolidation of small stacks by manually loading into trailers, hauling by tractor, and placing of merchandise in larger stacks;
- [4] loading from stacks into trailers or directly into large railroad cars;
- [5] transfer from narrow-gauge cars into standard-gauge cars;
- [6] transfer from river boats into sea-going vessels;
- [7] unloading merchandise brought by tractor-trailers into vessels; rarely, loading directly into stacks alongside vessels;

[8] manual loading of finished or semifinished merchandise from warehouses or from the ground into cars;

[9] mechanical (rarely manual) loading of railroad ties from stacks into large railroad cars (2 to 3 percent).

Merchandise arrives from lumber mills in narrow-gauge railroad cars; rarely, resinous lumber arrives in river boats to be loaded onto sea-going ships.

In order to speed up handling, storage areas are divided into sections. The interior of the sections of one type are divided up for special uses: ties, cases, beech, resinous wood.

Tractors and trailers are used to transport merchandise over longer distances in cases where appropriate storage is already occupied by old stacks when cars arrive.

Cars being loaded are placed manually or by tractor at the larger stack until the loading is completed.

Merchandise is placed in cars of shipping crates manually and with care, often requiring special effort.

The most difficult operations are the manual loading and unloading of heavy pieces and the placing of merchandise in defective vessels.

Loaded railroad cars of those to be loaded are connected three hours a day, in three transits, at fixed hours:

Transit I: operated from 6:30 to 11; cars are switched from 11 to 13.

Transit II: operated from 13 to 18; cars are switched from 18 to 20:30.

Transit III: operated from 20:30 to 4:30; cars are switched from 4:30 to 6:30.

The maximum number of cars which can be connected is likewise fixed: 150 narrow-gauge railway cars and 32 standard-gauge cars per transit. This number is too high for the present potentialities, given also the lack of rhythm in connecting cars, about which we will say more later.

All the cars connected must be operated during these hours. Given that the switching of cars takes about two hours for each transit, the unloading requires 4 to 5 hours for cars under 27 tons loaded and 8 to 10 hours for standard cars weighing over 27 tons loaded.

From organizational reasons and because of the unrhythmic coupling of cars, an average of some 13,000 hours were charged to the port.

In the last few years there were numerous delays for steamships entering berths.

There is an obligation in transport contracts for vessels which governs the time in which vessels must operate. In cases where the time set down for execution of maneuvering and unloading operations (stalli) has run out, whoever is to blame suffers a fine (contrastalli) the sum of which is fixed by contract according to the size of the vessel and the unloading conditions.

However, if operations are carried out ahead of schedule, a rebate (dispatch) is paid equal to half the value fixed for the fine for the same interval of time. Both fines and rebates are calculated for foreign ships.

Experience shows that the optimum system is for workers with lumber to work two shifts of eight hours, with pauses coinciding with the time for maneuvering cars and two shifts of eight consecutive hours on the ships.

An attempt is generally made to work eight consecutive hours, but because of interruptions during the switching of cars, workers have worked only 5 or 6 hours per shift.

Another kind of organization is adopted temporarily for exceptional cases, and occasionally floaters are also used.

The resultant principal technico-economic indices relate to the productivity of workers and of machinery, to the extent of use of equipment, the cost of operations, the stationary time of ships and cars during loading and unloading operations, etc.

Some evaluations and proposals can be made in connection with the improvement of these indices.

## 1. In Connection with the Execution of Car Operations

Some difficulties are encountered in these manipulations.

For example, if a series of cars cannot be connected at the hour fixed for transit, the railroad organs do not connect these cars until the following transit--that is, over six and one half to ten and one half hours later. It has been asked that a way be found for delayed cars to be connected after the hour fixed for the transit. The railroad organs agreed in principle but on the condition that these cars would always be operated during the transit interval and [that they would] not be held responsible for the delay of the cars. Each car not operated at this time is to be listed as delayed and is to pay the respective location [fee], which the port cannot guarantee.

Because of this misunderstanding, the respective cars remain idel many more hours in order to be connected with the following transit, which may come at a peak hour and cannot be operated, wherein delays and placement for loading at a still later date result.

Another difficult arises in the calculation of placement for loading. Even if a car is delayed an hour or less on its respective transit, it is calculated as placed during the whole transit period until the following transit, that is to say, five to six hours, because the cars are not removed between transits.

Consequently, besides unjust payment for placement, cars ready for operation are held in place until the entire subsequent transit is finished and are removed together with the other cars operated in this transit--that is to say, after four to five hours more. The cause being the lack of locomotives, we would think that because many cars are operated in this zone, for both lumber and minerals, an additional locomotive would fully justify the increased expense, at least during the period of increased requests for cars.

Concerning the system for announcement and cancellation of cars, the railroad organs are obliged to announce the number of cars introduced for operations in a transit three hours before the transit hour to "Exportlemn," which informs the loading (portuare) organs two and a half hours before [the transit hour].

If, however, the cars are delayed for any reason at all enroute, the railroad organ can no longer connect them and has the right without penalty to cancel them, to not connect them, and to announce by canceling the loading sector, occasionally even on the hour fixed for connecting them. The

result is that the loading section, which is organized for the number of cars announed, is no longer able to utilize the workers who were prepared to receive the respective cars.

Two deficiencies result from this fact:

a) The workers are not able to work rhythmically at all times.

b) The waiting workers, after their shift ends, are replaced by workers scheduled for the subsequent shift, which is counted as a normal shift. At the same time, other cars are added to the delayed cars, thus often raising the number of cars beyond the usual work capacities. The loading organs, not having reserve working forces on which to call at any hour, will produce car delays and placement payments.

Another difficulty consists in the large number of cars which are connected for operations at night.

The hours of waiting as well as a large number of car placements result because of the above difficulties encountered in loading activities.

We would think that it would be necessary to re-examine the provisions of the order common to organs for rail and loading management, which regulate the relations between rail transport units and "Exportlemn," and the fixing of duties and penalties in respect to the share contributed by each organ, as well as the according of larger capacities to local railroad organs.

At first view, it would appear that non-arrivals would be eliminated if a locomotive were appropriated by the loading section (through endowment or rented from the CFR [Caile Ferate Romine; Rumanian Railways]).

The solution is not just however, because the locomotive could not be properly utilized.

As was shown above, we would think that the railroad organs, with reserves at their disposal in the zone, would also be able to meet the needs for additional switching in the cases shown above.

The locomotive, by using the railroad tracks, would be able to reverse and do other switching and would be able to know

better when it was necessary to remove cars operating in the interior of the lumber basin, taking into account, however, that supplementary requests for locomotives also occur rarely.

## 2. Improvement of Mechanization

The following give the values of several principal indices concerning the mechanization of lumber operations:

Indices of use of calendar time by mechanized equipment	22 percent
Time used by mechanized winches per ton of lumber [hours]	0.135
Productivity of winches per hour of operation	7.46 tons

The value of these indices is relatively small because the type of winch is not suited for all the kinds of operations and merchandise that appear in this sector. Similarly, the method in which depositions are effected and the condition in which cars are found loaded with timber has a negative influence on the realization of these indices. A supply of electric power to all zones of this sector would make possible a more extensive use of electric winches.

Table 1 presents a summary analysis of the technological processes carried out manually and by machine during the loading of timbers from stacks into cars.

Table 1

Operation	Type of Operation	Number of Workers	Phase Norm tons per hour	Productivity tons per man-hour
Unstacking	manual	1	4.310	
	mechanical	1	5.190	
Transport to car:				
a) by climbing into the car	manual	3	1.437	
b) by arranging hoist loads	mechanical	3	1.730	

[table continued]

[Table 1 continued]

Raising hoist loads				
into car	mechanical	-	-	
Stacking in the car	manual	2	2.155	
	mechanical	2	2.595	
Total	manual	6	4.130	0.718
	mechanical	6	5.190	0.865

According to the results in the table, productivity at all stages grows by 20.5 percent where operations are mechanized.

The same number of workers are used in each phase, whether it is carried out manually or by machine. This explanation justifies both the small increase in productivity and the unsuitable type of winches used.

One disadvantage also consists in the fact that too large a motor was installed on the winches used. Since it cannot be stopped and started continually, the wear and tear is increased.

A machine with continuous action, such as a conveyor belt, would be very suitable in this case; its prototype, which is fitted with a motor of only 3 or 4 horsepower instead of 25 horsepower, is being executed by the DRNFG.

A substantial improvement would be obtained through the use of overhead hoists [monorai?] to unload cars in one section of the basin. They would be mounted over two rail lines (including one narrow and one standard) and would assure rapid unloading of cars; they would be able to load trailers mechanically, would secure a better utilization of platforms, would permit transfers from car to car, would lessen manual transport, would raise the productivity of winches for unloading cars by at least 200 percent.

Proposals for complete mechanization were included in the study for systemization of the port of Galati (including the lumber basin recently set up by the planning organs of the Ministry of Transportation and Telecommunication (Ministerul Transporturilor si Telecomunicatiilor). This study essayed the use of motor vehicle transport and dump trucks in large numbers. This would have the effect of increasing labor productivity by 25 to 55 percent (in the two stages) and making judicious use of the storage space (with stacks 4, 5, or 6 meters high instead of one or two meters, as at present).



At present, the "Exportlemn" enterprise uses about 14 hectares of platform, on which, normally, about 70,000 cubic meters of lumber must be deposited. Currently about 30,000 cubic meters are deposited. In a single year, 60,000 cubic meters would be deposited, thereby giving a norm of 0.5 cubic meters per square meter, which is rational.

All of these proposals for mechanization would reduce the docking time of vessels by 46 to 57 percent, while the productivity of all installations would reach 384 to 492 tons per hour.

\* \* \*

### 3. Self-Administration of the Sector

One measure which would make it possible to eliminate a large part of these deficiencies would be self-administration of the sector.

Through self-administration, organs of local management and of DRNFG would be able to fix more precisely the responsibilities, the kind of organization, and the deployment of working forces, but especially to would ensure that locally taken measures would have obvious economic effects. It would constitute a rectification of future work in the sector and a stimulus toward better and better achievements.

\* \* \*

### 4. Investments

In the 10-year interval between 1949 and 1959, a series of capital projects were carried out in the port of Galati, increasing by about 25 percent the value of previous investments.

Among these we enumerate: 320 meters of embankment (pereu) in the lumber basin, 5,600 meters of railroad, 50,000 square meters of roads and platforms, mechanized equipment, facilities for supplying water, drainage, lighting and power networks, administrative buildings, etc.

The plan for systematizing the port of Galati provides for new projects for the lumber basin, as a result of which a sizeable improvement will be made in the degree of mechanization of worker productivity and, thus, an increase in the loading capacities and in loading traffic.

A part of these proposals were included in the investment plans for the years 1958 and 1959.

The investments aim to improve the indices, putting primary emphasis on the improvement of working conditions in the work sector.

In the old days, unpaved platforms in the lumber basin meant that work had to be done in clouds of dust, while in summer and autumn there was mud into which the ox carts sank to their wheel blocks.

In recent times, paved platforms and macadam roads have permitted work under hygienic conditions for man, while transportation with carts has been completely replaced by tractors and trailers.

## RUMANIA

### Achievements in the Lumber Industry

[This is a translation of excerpts from an article in Industria Lemnului, Vol XI, No 1, January 1960, Bucharest, pages 1-3; CSO: 3774-N]

At the instigation and under the intelligent guidance of the Party, workers in industry, construction, and agriculture and those in the rest of the economy mobilized large internal reserves for the fulfillment and overfulfillment of the 1959 state plan in basic indices--production, labor productivity, and reduction of costs--thus creating the premises necessary for the development of economic activities during 1960 under better conditions than in the past.

The wood industry sector realized the entire 1959 industrial production plan by 21 December; a large part of the enterprises of this sector, such as IPROFIL [Institutul de Proiectari Forestiere si pentru Industria Lemnului; Planning Institute for the Wood Industry], "Alexandre Tamas" of Sighet, "Placajul" of Bucharest, "Gheorghe Doja" of Arad, "Fifth Anniversary of the RPR" of Ramnicu Vilcea, "Tehnolamn" of Timisoara, the agglomerated plywood factory of Braila, IPRAL [not identified] of Galautas, IFIL [not identified] of Reghin, TIL (Trustul Industrii Lemnului; Industrial Wood Combine) of Meircurea Ciuc, IRUM [not identified] of Sibiu, and others fulfilling the quotas of the 1959 plan ahead of schedule.

As fruits of the efforts expended, the collectives of workers, engineers, and technicians of the wood industry have harvested beyond the plan in the first eleven months of 1959 such valuable produce as: over 37,000 cubic meters of pine timber, 10,300 cubic meters of oak timber, 8,200 cubic meters of soft wood, 20,300 cubic meters of wood pulp from pine, 3,302 cubic meters of oak staves, 88,000 square meters of parquetry, 1,940 tons of agglomerated wood ply, 1,900 cubic meters of plywood, 25,300,000 match sticks, furniture valued over 8,700,000 lei, and other produce.

Translating into reality the tasks set by the Second Congress of the PMR [Partidul Muncitoresc Roman; Rumanian Workers' Party] and by the plenary of the CC [Comitetul Central al

PMR; Central Committee], PMR of 26-28 November 1958, concerning the complex and integral valuation of wood, and mobilizing large internal reserves, the workers of this sector achieved numerous important successes in the course of 1957.

Within the framework of the Wood Industry Combine at Galautas, a plywood factory with a capacity of 18,000 cubic meters of plywood and the first factory in the country for making block board from rotary-cut veneer were put into operation, with the result that a new factory for agglomerated ply obtained through extrusion is also to be put into operation in the first six months of 1960.

Construction of the Targu Jiu-Preajba Combine and the furniture factories at Iasi and Bucuresti-Militari was continued in order to carry out the tasks concerning the superior utilization of wood, and the construction of three new industrial complexes (Blaj, Cherla, and Pipera) and a new furniture factory at Magura Codlei were begun.

The Targu Jiu-Preajba Combine will industrialize [the production of] beechwood from the forested mountains in the north of Oltenia, with the result that its first unit (the plywood factory with a capacity of 18,000 cubic meters of plywood) should be put into operation at the beginning of 1960.

The beech wood provided by the forests in the south of Ardealul will be processed by the Blaj Combine components, which include a plywood factory with an annual capacity of 36,000 cubic meters, a furniture factory with a productivity of 10,000 units per year, a wood fiber ply factory with a capacity of 27,000 tons per year, and a factory for agglomerated ply with an annual production of 12,000 cubic meters.

The combine at Gherla will utilize the forestry resources of northern Ardealul; [this industrial complex] contains in its profile a plywood factory for 18,000 cubic meters per year; a veneer factory for 5,000,000 cubic meters; an agglomerated ply factory for 12,000 cubic meters, with a veneering section having a capacity of 850,000 square meters, and a section for production of 150,000 molded chairs (products manufactured industrially for the first time in this country).

The furniture factory at Militari will produce 8,000 units annually and will begin operations in the second quarter of 1960, producing new types of furniture suitable for new residences.

The new industrial complex at Pipera, which will begin operations at the end of 1960, is comprised of a furniture factory with an annual productive capacity of 15,000 units (also of new types), a veneer factory with an annual production of 2,500,000 square meters of veneer, an upholstery section, and a section for the production of 170,000 chairs of various types.

The modern match factory being constructed at Braila, along with the agglomerated ply factory, will produce annually 600 million boxes of matches, using for this purpose duplex or triplex reed cartons, a product of the factory at Chiscani which permits the realization of annual savings of nearly 13,000 cubic meters of Linden logs of superior quality.

The introduction of the method for shaving lamella from beech (without sawdust) at the factory in Falticeni and the new factory at Serdaru contributes substantially to the better utilization of wood materials, saving nearly 20,000 cubic meters of beech logs annually at these two factories.

The rest of the realizations in 1959 mark an increased contribution in support of the construction of new residences, which are developing with such abundance on the expanses of the fatherland. For this reason, the production of beech and oak parquetry increased by over 340,000 square meters compared to 1958, while with the aid of researchers a series of new products were realized, such as laminated parquetry, a superior product from the technical and aesthetic point of view, and at a cost one-half of that for the usual parquetry; panneling for collapsable forms from plywood and short lengths of timber. The new types of forms contribute in full to the realization of the task of reducing consumption norms for wood in construction and assembly, since, for example, plywood frames can be reused thirty or forty times while timbers are reused only three to four times.

In the same way, the delivery of timbers in fixed dimensions for agricultural wagons and machines was extended for the more economic use of wood, and construction of crates for furniture and glass panes from short pieces of timber and siding was initiated. Likewise, as a result of more rigorous processing and selection of factory wastes, the production of cellulose from residues has increased 11 percent, which is equivalent to saving a quantity of over 25,000 cubic meters of pine logs.

The production of furniture took an important step toward satisfying the need for a superior quality and a varied assortment. This grew in 1959 by over 32,000,000 lei compared to 1958, with the assortment being enlarged from seven types for combination and sleeping rooms in 1958 to fourteen types and numerous other separate pieces of furniture in 1959.

\* \* \*

The plenary meeting of 3-5 December 1959, after analyzing the draft plan for 1960, established the possibility of realizing a higher rhythm of development of superior wood industry production.

As a result of this fact, the volume of investment allocated to the wood industry in 1960 is nearly three times that for 1959, which makes it possible to initiate construction operations at six other wood industry complexes situated in Bacau, Pitesti, Constanta, Galati, Timisoara Regiune, and the Hungarian Autonomous Regiune, as well as to begin construction of complexes at Suceava and Odorhei.

## RUMANIA

### Saving of Raw Material to Reduce Cost Price in the Lumber Industry

[This is a translation of excerpts from an article by C. Emanoil and S. Banu in Probleme Economice, Vol XIII, No 1, January 1960, Bucharest, pages 18-33; CSO: 3784-N/a]

To bring about the industrialization and higher valuation of wood, the base of raw materials for industrial utilization was greatly increased in the years of the people's power without necessitating an increase in the volume of wood exploited annually from the forests. At the same time, with a view to an even more complete use of the wood mass, significant quantities of wood which previously were used year after year only as firewood were processed during these years into industrial production; for example while before the nationalization of the principal means of production only about 3 to 4 percent of the beech wood exploited annually was processed industrially (lumber, plywood, and planks), in 1959 over 27 percent of the beech was processed industrially (including planks and staves). The processing of the beech to such a high extent in comparison with the degree of processing during the time of the bourgeois landlord regime was made possible by the building of six new lumber plants and two barrel plants which use only beech and the reorganization of over 30 factories for coniferous lumber, so that over 50 percent of the units available in the wood sector at present use beech. Parallel with this, the production of the existing plywood plants processing only beech tripled, and, together with the new factory of Rimnicu Vilcea, in 1959 they used three times as much beech as in 1948. At the same time, the utilization of waste for industrial purposes in the industrial plants was begun on an ever larger scale, so that at present about 37 percent of the cellulose production is derived from the waste of wood factories.

Particular attention was also paid to willow and poplar, species which until recently were considered as having inferior wood and therefore were only used as firewood. Today about 100,000 cubic meters of willow and poplar, representing over 10 percent of the annual quota of these species, constitute the raw material for an industrial product of par-

ticular importance and quality--namely plywood of agglomerated wood ships (PAL) manufactured at one of the most modern installations of its type in Europe--the PAL factory of Braila--and the only one using wood speeces considered inferior from the point of view of the technological structure of the wood. This more complete utilization of the wood mass finds a rational application in the combines for the industrial utilization of (CIL) whose construction began after the Second Congress of the Rumanian Workers' Party. Some of these combines have already been placed into operation, as have those of Braila and Galautas, others such as those at Tg. Jiu, Blaj, Gherla and Pepera-Bucharest are being built, and still others are in the planning phase. The construction of large complexes for the industrialization of wood will take a great new stride forward in 1960, when, as shown by the Plenary Meeting of the Rumanian Workers' Party of December 1959, the construction of six additional industrial complexes is planned. The higher degree of industrialization of wood is expressed by the fact that in 1958 three times as large a value of finished product was obtained per cubic meter of wood mass as in 1938. The continuous increase in production as well as the high level of industrialization of wood permitted the satisfaction to an even higher degree of the increasing requirements for wood products of the national economy, not only quantitatively but qualitatively.

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Mobilized by the Party organs and organizations, the workers in the wood-processing industry have in past years obtained a series of successes in reducing the cost price as a result of equipping the branch with advanced technical means and of a greater preoccupation with the rational use of the wood raw material. These successes are more evident and more significant in the sector of finished wood products as compared to the sector of semifinished products (lumber factories), where the cost price showed some increases. This is explainable by the fact that in the period analyzed, a series of objective factors intervened (the resetting of prices for wood material, whereby a 50-percent increase was assigned for trunks used for the manufacture of lumber, as well as an increase in transportation costs on railways and trucks), and also because in some enterprises not all reserves were used for the reduction of specific consumption. This is why, eliminating the objective factors, the cost price in the



sector of semifinished products was reduced by only 1.22 percent compared with 1954. In spite of this, the revenue of the industrial sectors--semifinished and finished products--increased 25 percent in 1958 and 50 percent in the first 11 months of 1959 compared with 1955.

In contrast the reduction of costs in the finished products sector was almost continuous, as is shown by the figures in the following table, which is illuminating in this respect:<sup>1</sup>

Table 1  
(in percent)

<u>Year</u>	<u>Reduction of Cost Price</u>
1949	100.00
1950	89.67
1951	89.61
1952	85.04
1953	82.12
1954	85.69
1955	86.82
1956	83.00
1957	79.25
1958	77.61
1959	70.84

\* \* \*

In the cost structure of the main wood products, the element with the greatest weight is raw material and materials. Thus the value of the raw material and materials in lumber production represents 58 to 62 percent of the cost price; in the case of plywood, 50 percent; and for furniture, according to type, between 42 and 56 percent (of these, the auxiliary materials are insignificant in terms of cost price in the production of lumber, varying from 2 to 4 percent, and rise to 18 percent for plywood and about 37 percent for furniture); the expenses for the maintenance and operation of the equipment amount to 14 to 16 percent for lumber, 30 percent for plywood, and 16 percent for the Sovata type furniture, and direct wages amount to 12 to 14 percent in the production of lumber, 16 percent for plywood, and 20 percent for furniture.

Taking into consideration that in the wood processing industry the raw material represents the greatest amount in the cost price, the workers in this sector have tried particularly to reduce the specific consumption of raw materials (3 cubic meters of trunk per 3 cubic meters of lumber). As a result, the specific consumption of raw materials for products made of tree trunks has shown the following dynamics:

Table 2  
(in percent)

Lumber	1951	1952	1953	1954	1955	1956	1957	1958	1959
Pine	100	98.00	96.6	94.8	93.1	92.9	92.8	92.3	90.1
Beech	100	100.17	99.4	98.8	98.4	100.8	100.2	100.0	101.6
Oak	100	98.60	98.4	95.9	95.7	97.1	100.3	110.0	111.2
Plywood	100	105.90	100.2	102.0	95.8	94.7	94.2	95.4	90.1

The data in the table show a continuous reduction of the specific consumption in the exploitation of coniferous products, resulting from the technical-organizational measures taken, improvements in the technological process, and the attention given to the types of exploitation in relation to the dimensions and quality of the trunks. In the case of lumber products from coniferous sources, which constitute the largest part of lumber products (about 70 percent), the specific consumption has declined from 1.656 cubic meters of trunk per cubic meter of lumber in 1951 to 1.518 cubic meters of trunk per cubic meter of lumber in 1959. The corresponding specific consumption yield was 60.4 percent in 1951 and 65.3 percent in 1959. According to specialty calculations, the one-percent increase in the yield brings about a reduction in the cost of 1.6 percent for lumber from pine products and 2 percent for beech. The continuous decline in the specific consumption has thus brought about a decline of the cost price.

The same conclusions may be drawn from the exploitation of beech and oak, in which case the specific consumption continuously decreased up to 1956, when some factors intervened to change the method of work which had been used until then. At this time the gradual transfer of the processing of beams and staves from the exploitation sector to the industrial sector began. This led to the need for introducing some modifications in the specific consumption for oak and beech, because the percentage of rejects in the transformation from trunk to stave is greater than for lumber.

The transfer of the exploitation of beams and staves to the factories was made, however, for a more rational valuation of the wood, inasmuch as manual processing or processing in mechanized areas of beams and staves resulted in a loss of significant quantities of wood in the form of shavings. Through the processing of staves and beams in factories, an undeniable saving of wood is achieved as well as a significant benefit for the economy of this branch, not only because wasteful manual chopping is no longer practiced but also in connection with the processing at the mechanized areas in the forests.

In spite of the fact that sizeable successes were obtained in the management of the wood stock, the Plenary Meeting of the Central Committee of the Rumanian Workers' Party of December 1959 brought out the fact that there are still important reserves for a more rational use of wood which will lower the specific consumption in order to reduce cost. In view of their importance, we shall deal particularly with the possibilities of mobilizing the reserves for achieving economies in wood raw materials which will be reflected in a reduction in specific consumption--a decisive factor in the reduction of the cost.

As was shown before, a few years ago the transferring of the processing of beams and staves from the forests to the factories began; this activity, however, is not yet completed. The taking over of this operation integrally from the forests is in the process of completion, leading to a significant saving in raw materials and a direct effect on reducing the cost. Thus, in the case of exploiting these products in lumber factories, an additional 6 percent of lumber is obtained in the production of beams and staves, aside from the fact that the leftover material which was lost in the forests can now be used as fuel for the power plants of the factories, and in the near future will be usable as raw material for other higher quality products (PAL). The importance of these activities arises from the results obtained in production. For example, if the amounts of beams processed in the lumber years in 1959 and 1960 alone are considered (1,100,000 and 2,400,000 pieces respectively), it results that if we assume that half the beams were made by chopping in the forests and half in mechanized areas, an additional quantity of lumber and shavings in the value of 7,127,000 lei could be achieved in 1959 and 10,229,000 lei in 1960. It is self-evident that the savings in raw material obtainable in this way will be an important contribution to the reduction of the cost price in

the processing industry and that it is not limited to 1959 and 1960 alone. The particularly good results obtained so far by using this method of processing beams and staves fully justify the above-mentioned activity and recommend its decisive further application.

One of the most important reserves for the reduction of specific consumption to bring about savings in wood and a reduction in cost is intensification of the introduction of band saws for splitting in the pine products factories. Calculations show that such a tool, if used rationally, will bring about an increase of 1,300 cubic meters of lumber yearly coming from shavings, because this way uses a blade of only 2-millimeter thickness (including the "lace") as compared to the 3.0 to 3.6-millimeter thickness (including the lace) of the regular circular saw (gater). Of particular importance is the fact that obtaining and assembling a band saw costs, on the average, 100,000 lei, and that the value of the lumber recuperated in a single year is 340,000 lei, of which 100,000 lei is the value of the material which could be used for export. Taking into consideration these very advantageous economic results, we believe that it is necessary to extend these tools as much as possible. For each two to three saws available in the pine product factories, it is necessary to introduce one band saw for splitting, which means an additional sixty pieces over and above the number in operation at the present time. By placing these 60 new saws into operation it will be possible to obtain a supplementary production of 78,000 cubic meters of pine lumber, a very sizable quantity, not only for its value of 20.1 million lei--of which 6.1 million is suitable for export--but also because the availability of pine lumber increases by this amount not only through an increased use of raw material but also from a more rational use of the same amount of wood. One must also mention the fact that from the value obtainable from the export in just one year of lumber selected from the lumber recuperated from shavings, it would be possible to cover the cost of importing the 60 bandsaws for splitting as well as 38 ultra-modern circular saws. The effect of this brings about another saving, namely a reduction in the number of circular saws in use, which leads to a lowering in the number of servicing personnel without a reduction in productive capacity and with an appreciable increase in productivity.

By increasing the yield by the additional lumber as shown, and by increasing the productivity of labor through a reduction in equipment and servicing personnel, a reduction in the

production costs is achieved because a higher production is obtained with less equipment and a smaller labor force. Hypothetically, in 1961 exploitation will eliminate slanted edges, which is more rational, the specific consumption based on the increased production which will be obtained with the new equipment falling by 1965 to 1.626 cubic meters of trunk per cubic meter of pine lumber (yield of 61.5 percent) as compared with 1.653 cubic meters of trunk per cubic meter of lumber in 1961 (60.5 percent yield). Specialty calculations show that in the production of pine lumber a one-percent increase in the yield brings about 1.66 percent reduction in the cost, without taking into consideration the reductions brought about by this reduction of the value of raw materials in the cost of other components such as auxiliary materials, wages, expenditures for the maintenance and operation of equipment, etc.

The exclusive use of thin blades in circular saws is another important reserve which may contribute to the saving of raw material and to a reduction in the cost price in the lumber-processing industry. Not everything has been done in this respect in our country, although in other countries such blades are used exclusively. The timorousness in introducing them in our industry is not justified. This is particularly so since it is known that for each 0.2-millimeter reduction in the thickness of the blade there is a 0.7-percent increase in the yield. By introducing only thin blades with an average thickness of 2 millimeters as against the 2.2 millimeters as at present, and figuring that only eight blades will be used in each cutting model, the total thickness of the narrow blades is 1.6 millimeters smaller and increases the yield by 5.6 percent. If this increase is added to the 1961 annual yield, which under the working conditions for that year will be 60.5 percent in the cost of coniferous products, it will become 66.10 percent, corresponding to a specific consumption of 1.513 cubic meters of trunk per cubic meter of lumber as against a specific consumption of 1.653 cubic meters and a yield of 60.5 percent. In other words, a reduction of the specific consumption of 0.140 cubic meters of trunk is achieved for each cubic meter of lumber, which means a 9.3-percent reduction in the cost of lumber.

For saving wood and thus reducing costs in the wood-processing industry, the introduction of band saws for trunks instead of circular saws is of particular importance in the factories processing deciduous timber. The use of bandsaws instead of circular saws has two great advantages--namely, a 4-percent

average higher yield owing to a lowering of the percentage of sawdust by the use of a thinner blade, and a rise in the quality of at least one percent. As a result, the yield in the case of beech will increase from 55.9 percent, and the specific consumption will fall by 0.116 from 1.786 to 1.670 cubic meters of trunk per cubic meter of lumber. This reduction in specific consumption resulting from the replacement of the circular saws with bandsaws will allow an 8-percent reduction in the cost of beech lumber. Quantitatively, the addition of beech lumber will consist of 76,000 cubic meters with a value of 30.4 million lei, of which 20 percent is suitable for export. From a similar calculation there results an addition of 10,700 cubic meters of oak lumber, assuming that in the factories processing deciduous timber 100 circular saws will be replaced by 100 bandsaws for trunks, and the value of these could be covered by the savings achieved in less than a year from the lumber recuperated from sawdust, without taking into consideration the increase in value resulting from an improvement in quality. Aside from the advantages shown, the above-mentioned equipment also brings savings in the wage fund. A circular saw which, in the exploitation of beech, has six circular saws and pendulums as auxiliary machines requires at least 12 workers, while on a line of bandsaws nine workers are sufficient. Thus, the annual saving of 76,000 cubic meters of beech lumber, and of 10,700 cubic meters of oak recuperated from sawdust, leads to a 4-percent rise in the utilization index of wood for industrial purposes and to an 8-percent reduction in the cost price for these types.

Important savings of wood can also be obtained by changing the technological process for the manufacture of packing crates, replacing the production of lumber boxes with rolled off or straight-cut slats. As is known, crates were and are mass-produced. Until 1955 they were only produced from coniferous material, using about 265,000 cubic meters of lumber requiring 410,000 cubic meters of trunks. The activity directed toward the domestic consumers led to a particularly important result for the stock of coniferous lumber in the national economy-namely, the determination to use crates made of beech rather than coniferous wood for internal consumption. At first the technological process used in coniferous processing was also used in the manufacture of beech crates, but in the last two years the manufacture of the crates according to a new technological process began. The trunks are rolled off or cut into slats instead of lumber with machines equipped with blades instead of saws, thereby reducing the percentage

of sawdust-type waste from 14 percent to 6 percent. The new procedure leads to significant savings in raw materials, having a specific consumption of 2.2 cubic meters of trunk per cubic meter of crate as against 2.2 cubic meters where sawed lumber was used. If we consider that between 1960 and 1965, 100,000 cubic meters of crates will have to be produced annually, it follows that during this period about 600,000 cubic meters of beech trunks--i.e., 100,000 cubic meters per year--will be saved, with a value of about 15 million lei annually. By changing the technological process, the raw material used per cubic meter of crates costs only 330 lei, as against 574 lei in the case of lumber crates, leading to a reduction in the cost per cubic meter of crate of 17 percent. Inasmuch as at present the wood-processing sector has available only a limited industrial capacity for the manufacture of crates from straight-cut slats, the completion of the needed capacity for the production of beech crates is necessary in order no longer to lose one cubic meter of trunk for every cubic meter of crates.

Aside from the technical-organizational measures in the plants for semifinished products to bring about a saving of raw materials with a view to reducing the cost of the products, the wood processing industry also has the task of facilitating a reduction in the cost of products processed from wood or those in which wood is used by the various consumer branches. This may be achieved in particular by extending the production of materials with fixed dimensions, which are needed for the manufacture of some mass-production items consuming significant quantities of pieces having the same dimensions, as for example: production of freight cars, agricultural machines, trucks, mechanical carpentering, furniture, etc. Delivery to the consumers of such materials will allow them to lower the specific consumption for the products they manufacture and thus reduce their cost price.

According to experiments made with materials of this type by the Institute for Planning and Scientific Research in the Wood Industry, there was a significant saving of wood. For example, the use of certain pieces of wood with fixed dimensions in the construction of freight cars and truck bodies led to reductions in specific consumption resulting in savings of up to 25 percent in the case of coniferous wood and up to 22 percent in the cost of beech, as against the use of lumber having the usual dimensions. Considering that about 200,000 cubic meters of cut wood will be processed into materials with fixed dimensions, which will approximately satisfy the

current needs of the various branches and constructions, the need for wood on the part of the consumer will be reduced by 22 percent--i.e., by 44,000 cubic meters of coniferous lumber with a value of at least 11 million lei.

Similarly, it was proved that the specific consumption could be reduced for the consumers if the material given to them were dried artificially in advance in the lumber yards, something not yet done by our enterprises as they are not yet equipped with suitable installations. Artificial drying which would require an average of about five days would bring about not only the elimination of losses to the consumers caused by the imperfect nature of the drying done by them but would also lead to a considerable lowering of the technical stock of the producing plants, as it would eliminate the material being conditioned prior to delivery to the beneficiaries until it has a humidity of 18 to 20 percent (calculated on the conditioned state), the conditioning requiring at least 80 days in the open air for coniferous wood and 140 to 150 days for beech. But the creation of technical stocks for this length of time means the immobilization of a considerable amount of the circulating funds of the enterprise. The permanent tying up of a technical stock of about 350,000 cubic meters of coniferous lumber for a period of 60 days leads to a blocking of this amount, which is about 90 million lei. If this storing is not done, the products would have to be delivered to the consumers in the green state with a humidity of about 40 percent, which would lead to an increase of about 27 million lei per year in the transportation costs because of the weight difference of the green material, and to the unnecessary immobilization of a significant number of freight cars. These data are calculated on the assumption that only half of the annual production would be transported in the green state and over an average distance of 250 kilometers. Artificial drying of the material in the lumber yards would lead to the elimination of drying by the consumers, who are unable to observe the technical conditions in full and thus bring about losses which often destroy the above-mentioned economies. In this lies the particular importance of equipping our lumber yards with installations for the artificial drying of the wood.

Another means by which the wood-processing industry could contribute to the obtaining of significant savings and to a reduction in costs in the field of wood consumption is the introduction of exploitation of coniferous wood with restricted conditions regulating the admissibility of slants.<sup>2</sup> It is



known that under current operating conditions pieces are produced which do not have all four edges complete from one end to the other. For this reason, some of the beneficiaries receiving such material are compelled to reshape it in order to eliminate these slanted edges. The material resulting from this handling, spread in relatively small quantities to the different parts of the country, cannot be the object of economical collecting, even though it is a very good quality raw material for the cellulose industry. Considering that the consumers reshape about 200,000 cubic meters of lumber and that the losses are 10 percent, 20,000 cubic meters of waste are lost or at best burned. Through an operation eliminating such slants in the lumber yards, these waste products can be collected and delivered to the cellulose plants instead of the 20,000 cubic meters of trunks which thus will be made available for transformation into lumber. From the 20,000 cubic meters of trunks no longer used for cellulose one could obtain 12,000 cubic meters of lumber having a value of about 3 million lei. The new technological process leads to a 12- to 25-percent reduction in the specific consumption of the factories using and processing wood, which implies the reduction of the cost price for the products manufactured by them (freight cars, automobiles, construction carpentry, etc.).

An analysis of the possibilities of saving wood in the sector of semifinished products, which, as was shown, includes important reserves in the existing factories, shows that these reserves are numerous and may contribute substantially to a reduction in the cost of wood products. If in addition to the measures which will assure the reduction of the specific consumption of raw and prime materials, good markets (for the industrial utilization of the waste which so far has been used mostly as fuel) are also assured for the factories making plywood of shavings and wood fibers produced in the new wood-processing combines, the existing factories will be given the possibility of a more rational valuation of their wood stock. They will find themselves, however, in an inferior position from an economic point of view in comparison with the complex combines, because the utilization of the waste will be more expensive through the handling and cost of transportation to the consumer and the 3 to 5 percent volume loss caused by the handling and transportation.

The measures taken for the saving of raw material and thus for the reduction of the cost of the various products made of wood, in both the industrial and the wood-consuming sectors,

refer to the existing lumber factories, since the new enterprises whose construction began after the Second Congress of the Rumanian Workers' Party are based on the new orientation and assure a more complete utilization of the wood in the industrial complex combines. Thus the Galautas Combine, which began operating at the beginning of 1959 uses beech for plywood. Of the volume of trunks going to this combine, 45.5 percent is transformed into plywood and 1.2 percent into sawdust; about 35 percent of the trunk waste becomes the raw material for another factory in the combine which makes panels from shavings; 6 percent of the waste is composed of sawdust and plywood leftovers mixed with various chemical substances and can be used only for fuel. One cannot recuperate 12 percent of the received volume of wood because 11 percent represents the difference in humidity from the green state in which the material is received at the factory and the finished product, and one percent represents actual losses. In fact, the volume difference caused by the humidity is not a loss, as it is a characteristic of nature and of the structure of wood. If the wood were received at the humidity level of the final product, the actual loss would be that shown (one percent) consisting of sawdust lost to the atmosphere and the small wastes which escape collection. Even in factories of lesser complexity appreciable result may be obtained in the utilization of the wood. Thus, the (PAL) factory in Braila, for plywood made of wood shavings, which for the time being makes no other products, not only uses types of wood which were formerly considered suitable only for burning and transforms them into an industrial product of high value and a wide range of uses but also achieves a percentage of utilization of the wood as high as 75 percent. In this manner, willow and poplar from the Danube meadows are transformed into a product used in building, the making of high quality furniture, the transportation industry, etc.

The greater the complexity of a combine, the greater the degree of utilization of the wood. In such combines, the waste can be collected and used as raw material for PAL, wood fiber panels (PFL), and the semi-chemical paste used for making cartons and packaging paper. Under such processing conditions, the raw material going into the factories in the form of trunks is utilized completely, if the volume of the wood is assumed to be in the absolutely dry state as it enters production. But even calculating the wood at its usual humidity content, the utilization indices in the new combines are far superior to those of the present factories, as shown by the following comparative figures:

From one cubic meter of wood the following can be obtained in a simple industrial unit of the existing type:

Table 3  
(in percent)

	Pine Cut Into Pieces	Beech Cut Into Pieces	Cut Into Slabs
Lumber and other cut products	65	57	46.7
Industrial waste	10	5	8.3
Total	75	62	55.0

In the case of the processing of wood in the new combines, the industrial utilization indices are as follows:

Table 4  
(in percent)

	Pine Cut Into Pieces	Beech Cut Into Pieces	Cut Into Slabs
Lumber and other cut products	65	57	46.7
Industrial waste	15	22	35
Total	80	79	81.7

In the cases of both pine and beech, the difference up to 100 percent consists of sawdust (which at present is burned) and the greater length of the processed products in order to cover the volume loss due to the drying of the wood. In the case of combines more complex than lumber, plywood, PAL or PFL, such as the ones mentioned in Table 4, which also include sections for furniture, rails, flooring, etc., and which also use material other than round wood (lumber, veneer, cellular plates, etc.), the utilization indices rise to 87 percent so that this index varies between 80 and 87 percent in the case of lumber with a humidity calculated at 10 to 15 percent.

The achieving of the utilization index of the wood in the new combines at the percentages shown indicates that the task relating to the complete utilization of the wood can be considered as fulfilled with regard to the present developmental stage of the wood and chemical industry, with the expectation that in the meantime a more valuable formula for the utilization of sawdust would be found, this being the only waste from the processing of wood which is not as yet industrialized. It is possible that in the near future the chemical industry will also use this waste for hydrolysis, in which case the utilization index of the wood will increase in terms of the species to 90 to 92 percent if the usual humidity is assumed or up to 98 percent if the calculations are based on the anhydrous state.

Let us consider briefly the second group of costs which enter into the composition of the cost price in terms of their importance: direct wages and expenses for the maintenance and operation of equipment. It is possible to reduce these costs by increasing the productivity of labor, which in turn is determined by the level of productivity of the enterprises, their proper utilization, the degree of mechanization, the organization of the work area, etc.

In past years important successes were obtained in increasing the productivity of labor in the wood industry by raising the technical level of the enterprises and by a better use of the machines. Compared with 1950, for example, the productivity of labor in the wood-processing industry increased by 88 percent in 1958. The productivity in natural units has also increased to a significant extent; thus, from the about 0.450 cubic meters of pine lumber obtained per man per eight hours in 1948 we went to a national average of 0.834 cubic meters per man per eight hours in the first quarter of 1959. A series of enterprises have surpassed this average; for example, the Wood Industry Trust of Cimpulung Moldovenesc achieved 0.980 cubic meters and that of Falriceni 0.900 cubic meters. In this connection, however, there are still a number of reserves which may be mobilized.

It is self-evident that the manner in which these factors influence the reduction of the cost price must be followed up from the point of view of the new combines being built at present and that of the existing units. In the new combines all the factors mentioned are at a higher technical level; the equipment is the expression of the most advanced existing technologies in similar factories in other countries, permit-

ting the use of processes with most phases mechanized and even some automated ones, as is the case with the factory making plywood from woodshavings in Braila and some phases at the Lumber Factory of Curtea de Arges. In these combines, the necessary conditions for achieving a high productivity of labor and a lower cost are assured by the construction. The construction and the equipment with technological and thermal power equipment of these new factories were carried out in the light of the tasks outlined by the Second Congress of the Rumanian Workers' Party and the Plenary Meeting of the Central Committee of the Rumanian Workers' Party of November 1958.

In the existing factories, however, it is necessary to take measures for utilizing the still unused reserves which must be done even if it entails making some investments. This activity is so much the more justified as its effect on the reduction of the cost is especially great and the recuperation of the investments can occur within a very short time, as was shown in the analysis made of the use of raw materials.

The most important activity which may lead to a considerable increase in the productivity of labor and thus to a reduction in cost is the introduction of a new technology in the existing factories. One of the principal measures which can be taken in this respect is the replacement of used and old type circular saws with new modern ones, which will contribute fully to increasing the productivity of labor. In this respect there are significant reserves in our enterprises. The average per sector in the curring up of pine using the present circular saws is not more than 0.150 cubic meters per inch per hour. The modern circular saws at present achieve 0.300 cubic meters per inch per hour. If, for example, we adopt only the medium circular saws, the present productivity would double, as we would be able to halve the number of such machines without diminishing the productive capacity. Even though the modern circular saws consume more power, this will not be more than that consumed by all those that they will replace. However, they will lead in turn to a saving of wage costs, auxiliary machines and equipment, and surface area, all of which contribute to reducing costs. Here is an example: the factory in Nehoiu has in operation 12 circular saws with 370 inch openings and can cut 190,000 cubic meters of coniferous wood per year in two shifts, which amounts to 0.118 cubic meters per inch per hour. If the current saws were replaced by those having an average productivity of 0.250 cubic meters per inch per hour (which means 6 to 7 cubic

meters per hour per saw), the same quantity of 190,000 cubic meters of trunk could be cut in one year with 6 saws. Such a transformation has already been made by us in the last two years. At Curtea de Arges in the old Arges 1 Factory 6 circular saws with 166 inch openings, which cut 77,000 cubic meters of coniferous trunks, were in operation. Recently a new factory was built with only two high-speed circular saws, having 56 inch openings altogether. These two saws can cut 65,000 cubic meters of trunk, which is equivalent to 7 cubic meters of trunk per hour per saw, or 0.250 cubic meters per inch per hour, as against the 0.105 cubic meters per inch per hour in the old factory. At the same time, there is a saving on labor. While at the old factory in Cuttea de Arges a circular saw was attended by 12 "gater" workers (gateristi) and 12 circular was workers (circularisti), in the new factory only four "gater" workers and six circular saw workers are employed, i.e., a total of 10 as against 24. One may conclude that a reduction to half the amount of equipment causes the wage and maintenance expenses to be lowered in approximately the same proportion. The positive consequences which the modernization of the factories will have on increasing the productivity of labor and on reducing the costs fully justify the replacement of existing saws with modern ones.

The introduction of mechanization and of small mechanization also has a positive influence on increasing the productivity of labor and thus on lowering the cost price. This contributes considerably toward improved working conditions by reducing heavy work. Significant successes were achieved by us in this respect during the past few years; the fact that it is possible for the enterprises to get direct loans from the State Bank, repayable in two years, has significantly aided the introduction of mechanization and small mechanization. The effect of this on the cost has not as yet shown up, because the 1957 loans will only be completely repaid this year, the loans being repaid exclusively from the yield of the operations carried out.

There is still much to be done along the lines of introducing mechanization and small mechanization in our wood processing enterprises. Thus it is continually necessary to introduce mechanisms for the handling of trunks in the lumber and plywood factories as well as to introduce conveyors in the trunk warehouses with a view to the mechanical transportation of the trunks into the "gater" hall. Similarly, it is necessary to increase the present level of mechanization

and semi-mechanization in the interior transportation in the factory halls, which so far is 50 percent, and the mechanization of traffic in the product warehouses, and especially in the lumber yards where much manual labor is used. By completing the mechanization and small mechanization work in the existing factories for semifinished products, we hope to raise the national average to 1.100 to 1.200 cubic meters of pine lumber per man per eight hours as against the 0.834 cubic meters achieved at present. Raising the productivity by 0.366 cubic meters per man per eight hours--i.e., by 42.7 percent--results in a significant lowering of the manpower cost, which may mean a 5.4-percent reduction in the cost price from the 1959 level. In the case of beech lumber, increasing the productivity in the same proportion as for pine may lead to a 5.5-percent reduction in the cost price.

Reserves for cost reduction exist not only in the case of the semifinished products discussed so far but also in the case of semifinished products of a higher type (plywood, PAL, panels) and in the case of finished wood products. Of these, the most important is plywood, whose cost is still at a very high level. For example, for the production of a cubic meter of plywood, the Plywood Factory of Galautas last year consumed 2.34 cubic meters of beech trunks, which is much more than the consumption of some older factories. More significant reserves for reducing the cost of plywood are the lowering of the expenditures for materials, wages, and those of the manufacturing sections. Usually the auxiliary materials are delivered by other branches; for example, the adhesives used in the manufacture of plywood play a great part in determining the cost price and are delivered by the chemical industry. The price at which the chemical industry delivers these adhesives, however, is high; its reduction by only 20 percent would lower the cost of raw material and materials by over 5 percent and the cost price of a cubic meter of plywood by 2.4 percent. The cost price of the plywood could also be reduced by lowering the consumption of labor per cubic meter, which at present is too high. By taking some technical-organizational measures that would allow a better utilization of the work time, the labor consumption per cubic meter of plywood could be reduced by about 10 percent, which would lead to a 1.6-percent reduction in the cost per cubic meter of plywood. In addition to this, increasing the productivity of labor in the proportion mentioned also contributes in about 10-percent reduction in the maintenance cost in the manufacturing section, which in turn may reduce the cost per cubic meter of plywood by another 3 percent.

Improving the production of plywood from the economic point of view has been a concern of the specialty experts. It has become even more so since the development of the productive capacity for this material will be increased materially. For this reason, it was decided at this time that for the four new factories being built at Tg. Jiu, Blaj, Gherla, and Suceava the necessary conditions that will lead to a continuous reduction of the cost price will be assured even in the planning stage. For this purpose the technological processes within the plans for the construction of these factories have been organized in such a way as to obtain the production of one cubic meter of plywood in 57 hours against the average of 80 hours per cubic meter currently prevailing in our older factories. This reduction in the consumption of labor per unit of product is reflected in a very great increase in the productivity of labor, which means a significant reduction in the cost of the plywood, a product which is expected to replace pine lumber to a significant extent in internal consumption as well as for export, where it is in demand.

Another product of mass production whose cost could be lowered is furniture. At the Plenary Meeting of Central Committee of the Rumanian Workers' Party of November 1958 it was shown that the furniture industry must be perfected, the variety of products enlarged and adapted to standard type apartments and the quality and appearance of the products continually improved in order to increasingly satisfy the demands of the population and increase the possibilities for export. In the production of furniture, the cost can be reduced by a more rational utilization of raw material and by a better use of the working day. The facts prove that in this respect there are significant reserves, the specific consumption in the furniture factories still being high. For example, in the first three quarters of 1959 the "Gh. Doja" Furniture Factory of Arad and the "Libertatea" Factory of Cluj achieved a utilization index for pine lumber 8 to 9 percent lower than planned. Similarly, the specific consumptions were surpassed for veneers, panels, beech lumber, etc., thereby wasting significant quantities of wood. This is why the attention of the enterprises must be directed in the first place toward saving raw materials in order to reduce the cost of furniture. For example, in the case of "Sovata" type bedroom furniture manufactured by the Tirgu Mures factory for wood-shavings plywood, at a rate of about 40,000 sets per year, the planned cost price can be reduced by using plywood made of wood shavings with a thickness of 12 and 16 millimeters instead of 19 millimeters, of which the principal com-



ponents of the furniture pieces should be cut, while the leftovers should be used for making the interior parts of the furniture. By this means, the specific consumption of plywood can be reduced by 4 percent, and thus contribute to a reduction of 3.8 percent in the cost of the furniture. Using the same method for the utilization of the wood in "Sibiu" type kitchens, also a mass production item, the cost price may be reduced by about 5 percent during the first stage. The cost can also be reduced in the case of other mass-produced products of the wood industry, such as other types of plain and curved furniture, carpentry for rails, barrels, beech barrels, etc. In the case of each product separately, there are possibilities for a reduction of about 3 to 7 percent in the specific consumption of raw materials, which will have positive influence on the reduction of the cost price.

Reserves for the reduction of the cost price are also present in operations which are currently performed manually; they could be improved by equipping the factories with equipment capable of carrying out these operations mechanically. After the installation in the present factories of such machines as those for multiple boring, vibrating sanding machines, polishing machines, etc., it will be possible to achieve a saving of about 10 percent on labor, which will lead to another 2-percent reduction in the cost of the "sovata" set and 2.2 percent for the "Sibiu" kitchen set.

An analysis of some of the main possibilities of the wood processing industry for reducing costs shows that there are significant reserves in this respect. Although the introduction of these reserves into production is dependent upon investments, these can in most cases be recuperated in less than a year. This is why the introduction of some new modern machines with a capacity to produce more and more cheaply is justified.

The preoccupation of the Party and government for a more rational use of our wood stock and the steps taken by the workers toward a continuous reduction of costs will contribute to raising the economic activity of the wood-processing industry to a higher level.

#### Footnotes

<sup>1</sup>The 1959 figures used are preliminary.

<sup>2</sup>Lumber with incomplete or torn edges.

## RUMANIA

### New Drilling Equipment

[This is a translation of excerpts from an article by M. Constantinescu in Petrol si Gaze, Vol 10, No 12, December 1959, Bucharest, pages 529-532; CSO: 3763-N/a]

Because of the current diversity of [drilling] equipment, the need was felt for a criterion by which to classify the installations.

The criterion chosen is the characteristic depth to which an installation can dig economically with 4.5-inch poles. As this is quite a flexible criterion, the socialist countries have, within the framework of the Council of Mutual Economic Aid, adopted a more precise characterization--namely the hook load.

A drilling installation is characterized by its maximum hook load. Aside from this maximum load, which may last for any length of time, an accidental maximum load 25 to 40 percent greater than normal and of short duration on the order of some minutes is also admitted. The largest overloading is allowed on light installations and the smallest one on heavy installations.

The normal series of installations allowed at present by the Council of Mutual Economic Aid is:

<u>Weight (tons)</u>	<u>Capable of Dig- ging Economical- ly up to (meters):</u>
50	1,200
75	1,800 to 2,000
125	3,000 to 3,200
200	4,000 to 4,500
300	6,000

\* \* \*

## Equipment Built in Rumania

Before the Second World War, only boilers of 15 and 25 kilograms per square centimeter were built in Rumania for steam drilling and drilling derricks. Other types of aggregates were built only occasionally.

Following the liberation of Rumania from the Fascist yoke, construction was begun on complete steam installations at the "1 May" Works of Ploesti and to a smaller extent at the Resita Works.

At the "1 May" Works, the following aggregates for steam drilling were built: the TF 15 drilling system modified into the TF 18 system, with a traction power of 18 tons at the pulley; the 12-inch and 150-ton hooks; steam pumps constituting installations able to dig up to 2,500 to 3,000 meters.

At the Resita Works, the following aggregates for heavy installations were built: cranes and 300-ton crown blocks, drilling systems with a traction power of 30 tons at the pulley; 7.75 x 15 x 20 inch steam pumps, and 14 x 14 inch steam machines capable of digging up to 4,000 meters.

Aside from these, 2 x 220 horsepower transmission pumps and reducers were built for installations activated by electric current.

Beginning with 1950, construction was begun on installations activated by Diesel motors.

The first attempt was the transmission built at the Steagul Rosu Works.

The results obtained were not as good as expected, primarily because of the defects in the multiple chains and in the fubber lining of the coupling.

Another important cause was the fact that a combination of a motor transmission and an air-powered coupling was used with a drilling system having clamp coupling, which proved to be unsuitable because drilling system defects appeared in the transmission.

For the above reasons, this transmission was no longer built nor used to complete the air coupling drilling system.

As there was an urgent need for installations capable of digging up to 800 meters with motors, the "1 May" installation was completed with two motors of 190 horsepower each. At this time the installation was based solely on elements produced on an industrial scale within our country.

The installation was activated by two M.G. 190 motors built at the "23 August" Plant. Power was transmitted through trapezoidal belts and the TF 18 drilling system was activated by a reverser with friction coupling.

The transmission pumps, 7.5 x 18 inches, were activated by trapezoidal belts.

The installation was relatively satisfactory. The aggregate causing the most difficulties was the reverser, which became worn quite rapidly because of the clamp coupling. It was soon seen that the installed power of 380 nominal horsepower, and almost 300 horsepower in continuous operation, was too small.

Nevertheless, some of these installations are still operating today.

Soon thereafter, construction began on the BU 40 drilling installation according to Soviet documentation, but utilizing M. G. 190 motors made in Rumania. A significant number of these installations were also exported, especially into China.

In the summer of 1954, the Designing Bureau was founded within the framework of the Sovrom Petroleum Equipment (Sovrom-Utilaj-Petrolifer), which was subsequently transformed into the Institute for the Planning and Research on Petroleum Equipment. At present this institute, together with others, constitutes the ITCME [not identified], within the framework of the Ministry of Heavy Industry,

The first subject proposed was to create within a very short period a powerful drilling installation equipped with Diesel motors for depths of 3,200 meters and turbine drilling, also using only domestic equipment.

A part of the component aggregates, such as the TF 18 drilling system rotating tables, the crane-crown block system, as well as the derrick, were taken from those being made at the time at the "1 May" Plant of Ploesti.

The power group was planned and equipped entirely with either 5 V-2-300 motors or M.G. 450 motors of the "23 August" type.

The power group of the installation called 5 D-150 is also based on transmission with trapezoidal belts.

What constituted a novelty in this installation was the use of pneumatic couplings with folds (burduf).

The TF 18 drilling system is activated through a reverser, also supplied with fold couplings.

Another novelty was the 450 horsepower Triplex pump, which gave good results in operation.

Compared to the older installations, the 5 D-150 installation has the following advantages:

- [1] great power, allowing the parallel functioning of the two mud pumps needed with turbine digging;
- [2] increased maneuvering speed in relation to the old installations;
- [3] increased degree of mechanization of control through the introduction of pneumatic couplings with folds in the intermediary transmissions.

The installation was satisfactory in operation and up to the end of 1958 many of them were built, some of which were exported to India, China, and other countries.

At present the 5 D installation operates in Rumania as well as the 4 D, which is actually the same installation with only four motors.

Nevertheless, the installation also has disadvantages, namely: it requires a large area and complex assembly, and some elements, such as the folds on the reverser, are worn out quickly.

A source of continuous difficulty is the MG 450 motor, which, however, does not pertain to the installation proper. There were frequent accidents, premature depreciation, and insufficient power delivery. This proved that a Diesel engine of the design used for this motor is not a modern and strong motor, and for that reason the construction of a different type of motor was insisted on.

With the 5 D-150 installation, the first developmental phase of petroleum equipment construction was concluded, a phase in which the shortcomings regarding some aspects of conception are explained by the [limited] possibilities of the productive plants at the time.

In the next phase, there was a transition to the more modern type of installations, comparable to those currently being built in the most advanced countries.

In their construction it is expected that account will be taken of the principles below, especially on the part of MIPC [not identified].

Every installation with thermic motors must be duplicated by an installation with an electric motor. The only exception is the 50-ton installation, which is only made thermic motors.

The small depth installations of 50 and 75 tons must also be made transportable (on trailers), and portable (in large sections).

The variants of each installation should be basically the same, so that a switch can be made from one type to the other with a minimum of modifications.

For the installations activated by thermic motors, the motors of various power should form a series having the same course and bore and as many common parts as possible.

The first installation in this series is the 4 LD-150 installation with a lifting capacity of 150 tons at the hook.

This installation is an integrated installation, including the derrick.

The characteristics of the installation are:

Installed (nominal) power	1,400 horsepower with Wolla (V-2-350) motors 1,400 horsepower with MG 450 motors
Number of speeds at pulley	six
Number of speeds at the revolving table	6 + 2 revolutions
Revolutions of the revolving table	35 to 270 per minute
Mud pumps	2 triplex 7.25 x 12 inch pumps

The derrick is in the shape of an A, has a height of 43 meters, and is made of soldered pipes.

To facilitate transportation and assembly, the legs of the drilling system are divided into three sections.

The assembling is done on the ground, and the derrick is lifted into working position with the aid of the drilling system through the crane-crown block system.

The legs of the drilling system are articulated in supports mounted on a substructure of 3.1 meters high, on which the drilling system, the revolving table, and the speed box are also situated.

On another substructure 1.5 meters high the motors, intermediate transmissions, and hydraulic couplings are mounted.

Both substructures represent soldered metallic products which can be dismantled into transportable blocks.

The motors are connected to the intermediate transmission through hydraulic couplings.

The intermediate is made in the shape of two metallic boxes of soldered construction, each box coupling two motors.

At the back box are located the axles, on which the wheels that transmit power for the pumps are mounted. The power is transmitted to the pumps through trapezoidal belts.

In the interior of the boxes, the transmission of the power flux is achieved with the aid of multiple chains with 1.5-inch links. The chains are lubricated under pressure with the aid of cogwheel pumps.

The various maneuvers in the intermediate take place across pneumatic couplings with disks.

The system permits coupling combination of the motors and controlling of the power flux to the pumps or to the drilling system as needed, without requiring a stoppage of any part of the installation.

The drilling system has a divided construction, with a separate speed box to facilitate transportation.

All the interior transmissions have multiple chains lubricated under pressure.

The controls are centralized in the operator's cabin.

The 4 LD installation was tried out in the yards with very good results and has been put into current production at the "1 May" Plant, with some units being exported to the USSR, India, and China.

As a result of the experience obtained with this installation in the yards and the requirements of the users, certain modifications were made in the installation creating the 4 LD-150 A type.

In spite of the fact that in the yard experiments that A type 150-ton capacity derrick showed very good resistance, it needed some modifications and it was not desirable to produce a large variety of derricks; thus it was replaced with the 200-ton capacity A type derrick, which will also be used in the 200-ton installation.

In the intermediate transmission the pneumatic couplings were taken out of the box for increased accessibility.

The triplex pump was also redesigned in order to make it stronger and raise its parameters.



## RUMANIA

### Economic Briefs

The contribution of the socialist sector to the composition of the central fund of agricultural products is continuously growing. Thus, since 1958 the socialist sector of agriculture has already made a decisive contribution to the formation of the central fund of vegetal and agricultural products, supplying 65 percent of the grain and rye, 44.8 percent of the corn, 60.2 percent of the sugar beets, 54.1 percent of the sunflowers, and 58.2 percent of the hemp. The contribution of the state agricultural farms is becoming continuously more important, and in 1959 they delivered to the state 520,000 tons of wheat and rye (40 percent more than in 1958), 70,000 tons of meat, and other products.

In socialism, the increase in production constitutes the source for increasing the income of workers. In our country, the monetary income of the population in the form of wages and allocations by the state for children and for pensions increased by about 8.4 billion lei in 1958 as compared to 1955. At the same time, the incomes of the working peasantry increased, as a result of terminating the obligatory quota deliveries for most agricultural products and as a result of the prices paid by the state when it buys agricultural products from them through contracts and acquisitions. In 1958 alone the working peasantry received over 8 billion lei for the products it sold to the state, 2.2 billion lei more than in 1955.

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As a result of increases in the income of the population, price reductions, and expansion of the system of instalment buying, the demand for wool and synthetic fiber fabrics and knitted goods, plastic goods, shoes of high quality ("Romarta" type), furniture, etc. increased. It is particularly significant that there was an important increase in the demand for a series of durable household products, sport and cultural products, and products of better quality. For example, in August 1959 as compared with August 1958, retail sales through state trade organs represented a 288.8-percent increase for

domestically produced radios, 129.0 percent for television sets, 384.6 percent for washing machines, 256.4 percent for bicycles, 262.8 percent for motorcycles, 192.3 percent for high-quality ("Romarta" type) shoes, etc.

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The measures taken as a result of the tasks outlined by the Plenary Meeting of the Central Committee of the Rumanian Workers' Party of December 1956 led to an improvement in the methods of planning and leadership in industry and trade; an increase in the competence of the local organs and enterprises in solving production problems and those associated with the circulation of goods; and a strengthening of the relations between the producing and trade enterprises, with significant positive effects on the adaptation of production to consumption and on the development of the national economy as a whole. Thus, in 1957 a series of important measures were taken, of which we may mention the following; The number of obligatory industrial products established by the state plan was reduced by about 30 percent compared with the previous year. The nomenclature of the products distributed by the Council of Ministers was reduced by 20 percent and that of the products distributed centrally by the ministries was reduced to half, thus greatly increasing the number of products which the enterprises could procure themselves through direct relations. Beginning in the same year, the distribution approved by the Council of Ministers included only the central organs representing the economic branches and concerned only those products which are of decisive importance. To increase the competence of the people's councils, these were given only the task of delivering that part of the production destined for the central fund. Similarly, with the exception of very few products, the people's councils were given the right to prepare their production plans themselves, establishing the types in collaboration with the local organs and in accordance with local needs. At present the production plan for consumer goods is established centrally for only the large product groups, the establishment of the types to be produced being done by the trade organizations and producing enterprises within the framework of their relationship. Toward the end of 1959 new measures were taken designed to ensure the continuous improvement of the relation between industry and trade (elimination of preliminary orders, introduction of quarterly contracts, etc.).

All these measures have contributed to the strengthening of democratic centralism in the economy and have considerably increased the capacity of industry to satisfy the consumer needs of the workers from the point of view of quantity as well as variety and quality. This was observed, for example, on the occasion of signing the economic contracts between industry and trade for 1959 and 1960. On this occasion the producing enterprises presented a much larger variety of products than in the previous year, as well as new models, etc., and the representatives of the trade enterprises were even able to obtain from the producing enterprises certain changes between groups of goods which has allowed the contracting under better conditions of some products greatly demanded by the consumers.

Similar measures were also taken in the field of trade. Thus, in order to increase the activities of the regional people's councils, the plan relating to retail distribution is being made only quarterly and by regione, the executive committees of the people's councils being given greater rights with respect to the distribution per sector and trade organizations as outlined in the plan, and generally with respect to the management of the stock of products within the regione. The number of products distributed to the executive committees of the regione people's councils by the Ministry of Trade was gradually reduced. For example, in 1958, 63 items in the field of food products were distributed according to central directives as against 102 items in 1956, and in the case of industrial products the number of items was reduced in the same period from 424 to 202, a fact which allowed greater possibilities for the judicious management of the stock of products and the obtaining of products in accordance with local needs. Beginning in 1959, the volume of retail distribution in the state plan was established only in the form of over-all values distributed quarterly, without indication of the category of products. In turn, the Ministry of Trade transmits this plan to the regional people's councils in the form of an over-all value figure, together with suggestions relating to its itemization among large sectors of activity ( food products, public catering, industrial products), and with a covering calculation which is also of a suggested character only. In this manner the regional people's councils are assured great possibilities for an ever more rational utilization of the stock of goods in relation to the needs of the region.

Similar measures were also taken with respect to the relations between the wholesale commercial enterprises and the retail commercial organizations concerning both the planning and the supply of goods. Within this framework, the introduction of a direct supply for the retail units--for example, a method which at present has an almost general applicability--and the gradual reduction of the nomenclature for wholesale distribution were provided for. In 1960 alone this nomenclature was reduced by almost 100 items. Reflecting the firm application by the Party of the principle of democratic centralism, the 1960 state plan provides for new measures for improving the management of the economy on the part of local Party and state organs. In the field of trade it is foreseen that the value of the merchandise delivered to the population by local state enterprises will increase to about 24 billion lei as against 16 billion lei in 1955.

All the measures taken for strengthening democratic centralism in the management of the economy have had significant positive effects on the development of the national economy as a whole.

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In certain departments there are still possibilities for improvement, even with respect to the planning methods. For example, the Department of Food Industry of the MIBC [not identified] established the 1959 production plan for the factories within its sector with respect to 25 types of cheese, whereas in the state plan only two indicators are foreseen; the Ministry of Heavy Industry has established in its production plan for the same year about 400 types of screws, etc. Even though cases like this are not numerous, they nevertheless tend to hamper the possibility of a complete adaptation of production to the consumer needs of the population and do not create the conditions required for the development of initiative on the part of the enterprises toward increasingly better satisfaction of needs. Similarly, in spite of the fact that in 1958 the number of products distributed centrally by the Department of Internal Trade was about 50 percent smaller than in 1956, the current nomenclature still includes quite a large number of products.

(Probleme Economice, Vol XIII, No 1, January 1960, Bucharest, pages 51, 54, 61-63; CSO: 3784-N/b)

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The economic organizational consolidation of the collective farms raises a whole series of problems relating to the development of public property, the increasing of production and labor productivity, the organization and distribution of work, the calculation of some synthetic indicators which will justly reflect the production results obtained by the collectives, etc. For the solution of these problems specialists who work directly or indirectly in the field of agriculture as well as collectivists are needed. An important means of debating and finding judicious solutions for such problems is consultation between leaders in production, specialists in the state management organs, researchers, teaching cadres, etc.

This is proved by the fruitful discussions organized in the past few years by the Ministry of Agriculture. A significant contribution in this direction was made by the discussion organized by this Ministry on 9-18 November 1959 in Bucharest in which the presidents and agronomic engineers of the leading collective farms, research economists and teaching cadres, and specialists from the Ministry took part. Within the framework of these discussions, particularly timely and important problems were discussed concerning the organization and distribution of work, the possibilities of obtaining an ever larger production in the plant and animal raising branches, and the calculation of the cost price. These problems were dealt with in papers submitted by the presidents and agronomic engineers of the collective farms, some teaching cadres, and the General Directorate on the Organization of the Socialist Sector of the Ministry.

In the papers presented on the organization of work, the experiences of some collective agricultural farms (Palazu Mare in Constanta Regiune, Pechea in Galati Regiune, Slovozia-Mindra in Bucharest Regiune, Tomnatic in Timisoara Regiune, and Madaras in Baia Mare Regiune) with the organization of complex brigades, which, as is known, were already organized on an experimental basis in 1958 in some collective farms in our country,<sup>1</sup> were given.

The papers and discussions showed that these brigades have a series of advantages contributing to increasing the co-interest of the collectivists in increasing production, the rational combination of plant and animal production, a more

rational use of the labor force, the strengthening of work discipline, and an increase in the incomes of the collective farms and of the collectivists.

The organization of such brigades arose out of a need for economic organizational consolidation of the collective farms themselves. The organization of the complex brigades is a particularly important problem. In connection with this, it was shown during the discussions that particular attention must be paid to the size of the brigade, distributing judiciously to each brigade a certain area with a varied and rational structure of cultivation by a given number of hands and with a corresponding supply of means of production, etc.

The examples given in the papers show that the sizes of these brigades vary from one farm to the other according to the size of the collective farm, the extent of its multilateral development, their specializations, etc.

An outstanding problem in connection with the organization of these brigades was the distribution per brigade of the animal species, orchards, and vineyard areas. Each collective farm solved this problem in terms of its specific conditions. Thus some farms, such as the Facaieni GAC in Constanta Regiune, the Tomnatic GAC in Timisoara Regiune, and the Madaras GAC in Baia Mare Regiune, distributed a certain species of animal to each brigade, while others, such as Comana and Palazu Mare in Constanta Regiune and Pechea in Galati Regiune, distributed the effective stock of each species of animal equally between the brigades, and where the stocks were small assigned them to a single brigade.

The organization of complex brigades in the collective farms led to a lowering of the number of brigadiers, team leaders, and work days for the administrative and management apparatuses, and led to increased labor productivity and reduced production costs per unit produced. It was emphasized at the discussions that this new form for the organization of work assures a closer collaboration with the tractor brigades and stimulates the interest of the mechanical workers to a greater extent in increasing production. The organization of complex brigades at the same time creates the conditions for a more judicious application of the socialist principle of the distribution of products according to the quantity and quality of work of each collectivist, taking into consideration not only the number of work days given but also the production obtained.

The discussions showed that these brigades can be organized only in the large multi-laterally developed farms led by well prepared cadres. At the same time, it was emphasized that other forms for the organization of work must not be underevaluated either--such as, the permanent brigade for specialized production; but on the contrary, these must be strengthened where complex brigades are not introduced. The discussions recommended that the use of complex brigades should also be tested in 1960 in a larger number of collective farms.

#### Footnote

<sup>1</sup>In 1959, for example, complex brigades were organized in the following regiunes: in Baia Mare in three GAC [Gospoderie agricola colectiva; agricultural collective farm]; in Constanta Regiune in 45 GAC's; in Craiova in four GAC's; in Galati in four GAC's; in Iasi in three GAC's; in Oreda in six GAC's; in Pitesti in one GAC; in Ploesti in two GAC's; in Suceava in one GAC; in Timisoara in 24 GAC's; in the Hungarian Autonomous Regiune in four GAC's. The number of collective farms in which such brigades were organized grew from 11 in 1958 to 97 in 1959.

(Probleme Economice, Vol XIII, No 1, January 1960, Bucharest, pages 113-114; CSO: 3784-N/b]

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#### New Investments for the Development of the Petroleum Industry

In Craiova and Pitesti Regiunes, new investments are being made for the development of the petroleum industry. At Ticleni, for example, work is in process on increasing the capacity of the station for debenzining and on a new station for compressors. At the same time, the new station for stabilization and for liquefied gases--the first installation of this type in the petroleum region of Oltenia--is being installed and will furnish a sizable quantity of liquefied gases for household consumption. Similarly, at Babeni a station for debenzining and one for compressors are in the process of being installed. The gas-lift compressor station, which was already put into operation during the first half of October,

opens up large possibilities for increasing the extraction of crude oil from the deposits.

(Petrol si Gaze, Vol 10, No 12, December 1959, Bucharest, page 544; CSO: 3763-N/b)

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### Work on the Refinery Yards of Onesti

At the No 10 Refinery Yard of Onesti, which is one of the main industrial units of the Petrochimic Complex of Borzesti, the assemblers and installers placed into operation in October--i.e., 40 days before the deadline--the installation for the absorption and fractioning of gases (AFG, an installation which has already started normal operation). With the aid of these installations, the crude oil extracted from the petroleum wells of Moldova will be processed, yielding the refinery gases, which, after chemical transformation, will be used in the rubber factories. In addition to this, installations for electrical desalination, two electric installations for atmospheric and vacuum distillation, the installation for thermic cracking, and some laboratories, pumping stations, etc. were installed so far at Onesti.

At the thermic cracking station the crude oil from the DAV [distilare atmosferica si vid; atmospheric and vacuum distillation] is processed at temperatures of 480 to 530 degrees; a chemical transformation of hydrocarbons is produced in the residues, giving a gasoline with an octane value higher than that obtained through atmospheric distillation.

At present two modern installations for catalytic cracking imported from the USSR are in the process of being installed, which will assure a better product and an increased yield from the crude oil. The reactor block, the most important part of the installations, the metallic construction of which weighs about 3,000 tons, will have a height of 63 meters; an 80-meter crane is being used for assembling it.

At the No 1 installation for catalytic cracking, steam-pipes will shortly be introduced and the general mechanical tests will be carried out in December. At the No 2 installation, the bunker for the regeneration of the catalyst was installed, and work is in process on the soldering of the



reactor sections and on the furnace of the installation; preparations are being made for assembling the compressors.

In the middle of October the collective from the absorption and fractioning installation furnished the first quantities of gas ("aragas") produced here for household use. The "aragas" is obtained from well gasoline and from the richer gases which result from the thermic cracking installation of the refinery.

(Petrol si Gaze, Vol X, No 12, December 1959, Bucharest, page 545; CSO: 3763-N/b)

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#### Management in the Danube Delta for Ensuring Reed-Type Raw Material

In order to ensure the supply of raw reed material required by the Cellulose and Paper Combine of Chiscani, the Ministry of the Petroleum and Chemical Industries has undertaken important jobs in the Danube Delta for the development of the reed base and for the mechanical harvesting and transportation of reeds. New canals were made over a length of 100 kilometers, 50 kilometers of ditches were built, and platforms covering an area of 65 hectares were set up for the loading and storage of the reeds. In the years come, the length of the trunk canals dug in the Danube Delta will reach more than 1,750 kilometers, and the length of the secondary canals over 450 kilometers; the length of the ditches built will be more than 250 kilometers, and the area of the platforms will be over 430 hectares. The reed bases in the Danube Delta are supplied with modern high-yield equipment (tractors, trucks with caterpillar treads, smaller trucks, etc.).

At Ostrovul Maliuc a Center for Reed Research was organized and equipped with modern laboratories and shops, and work was also begun there on the construction of worker homes.

Some calculations of specialists in this field show that about one million tons of reeds may be harvested annually from the Danube Delta. From the processing of the reeds harvested from 50,000 hectares alone--that is, from only one fifth of the Delta's reed area--it is possible to obtain enough cellulose to make 3 kilograms of paper and 7 kilograms of fabric

per year for each inhabitant of the country. From 50,000 tons of cellulose for viscose 23,000 tons of cellular fibers could be produced, which is equivalent to 120 million square meters of textile material. Moreover, each hectare of reed saves two hectares of forests when used in the manufacture of cellulose, so that the reed areas of the Delta which regenerate every year save a considerable area of forest which is barely regenerated in ten years.

(Celuloza si Hirtie, Vol 8, No 12, December 1959, Bucharest, page 401; CSO: 3763-N/c)

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#### The Cellulose and Paper Sector Fulfilled Its Plan for the Third Quarter of 1959

A permanent preoccupation of the workers of the cellulose-paper sector was the fulfillment of the plan for the third quarter, which was achieved to a proportion of 102.5 percent. By reducing the cost by 2.4 percent and increasing labor productivity by 1.4 percent, savings of 3,100,100 lei beyond the plan were achieved. Among the factories which contributed to the fulfillment of the quarterly plan are the "Steaua Rosie" Cellulose and Paper Plant, with an achievement of 103.7 percent; the "1 September" Paper Plant, with 103 percent; the "7 November" Corrugated and Undulated Paper Plant, with 104.8 percent, etc. In terms of products, the quarterly plan was fulfilled 104.2 percent for cellulose, 101.8 percent for paper, and 105.3 percent for cardboard products.

(Celuloza si Hirtie, Vol 8, No 12, December 1959, Bucharest, page 401; CSO: 3763-N/c)

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#### Increasing the Productive Capacity of the Existing Cellulose and Paper Factories

At the "Steaua Rosie" Cellulose and Paper Factory work is carried on intensively for increasing the productive capacity, at present in particular on new sections for the recuperation

of sulphur dioxide, for sorting and whitening, and for the purification of the water. Over 90 percent of the work is completed, so that by the end of this year the productive capacity of the factory will increase by 3,000 tons of cellulose.

After putting a vellum paper machine with a 9,000-ton capacity into operation at the "Reconstructia" Cellulose and Paper Factory, a second machine for thin paper with a capacity of 3,000 tons was put into operation. At the same time a 3-megawatt turbine supplied by the Resita Metallurgical Works was installed. After this turbine was put into operation the capacity for the production of electric current increased considerably. For the water supply of the factory, special pumps from the Bistrita River were installed which will increase the volume of industrial water for industrial processes considerably.

(Celuloza si Hirtie, Vol 8, No 12, December 1959, Bucharest, page 401; CSO: 3763-N/c)

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For the continuous development of consumer goods production, an enlarged variety and a considerably improved quality of the products, an increased investment volume was provided for 1959 as compared to 1958.

With these investments, the following main objectives were achieved in 1959:

- [1] The Aurora Dirste Malt Factory was put into operation.
- [2] A number of wine production centers having large wine storage capacities were put into operation.
- [3] Construction was begun on two new sugar factories.
- [4] Construction was begun on a milk powder factory at Cimpulung Moldovenesc.
- [5] Construction was begun on a dairy product combine at Bucharest.

(Industria Alimentara, Vol XI, No 12, December 1959, Bucharest, page 363; CSO: 3763-N/c)

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### Switching Locomotives in the Rumanian Railways

On the average, about 245 locomotives are used daily at 122 stations for purposes of public transportation, of which only six are small 120-horsepower Diesel locomotives with mechanical transmission and are more like locomotors.

The switch engines are almost all steam powered, most of them having been transferred from pulling trains.

The predominant series are as follows:

[1] The 50,000 type locomotives with an "adherence" (adherenta) weight of 62 percent of the service weight, maximum age 39 years, representing 31 percent of the total number of switch engines.

[2] The 40,000 type locomotives with an adherence weight of 60 percent of the service weight, maximum age 43 years, representing 21 percent of the total switch engines.

[3] The 326,000 type and other related series of locomotives, with an adherence weight of only 53.6 percent, maximum age 74 years, representing 28 percent of the total switch engines.

The total weight of all the steam switch engines in service is about 25,000 tons, which represents an average of 100 tons per engine.

(Revista Cailor Ferate, No 12, December 1959, Bucharest, page 635; CSO: 3763-N/c)

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